ISSUE 5 ■ NOVEMBER 1988 ■ £2.95

ST AMIGA FORMAT

The complete package for Atari ST and Commodore Amiga owners

CARTOON CAPERS

ALL YOU NEED TO KNOW TO CREATE YOUR OWN SUPERHERO

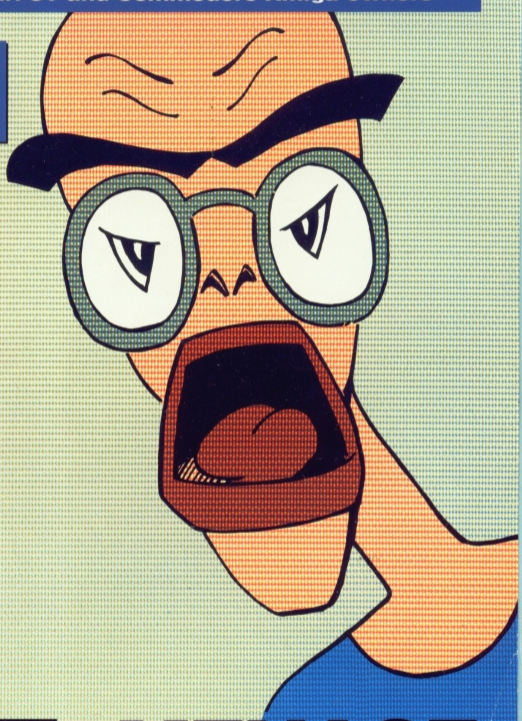

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Photo-quality pictures and the computers which generate them

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MENACE

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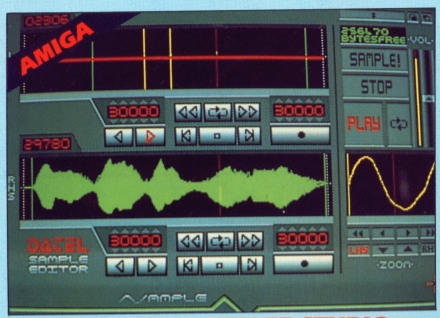

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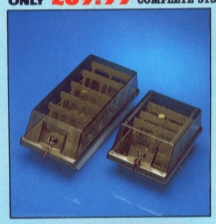

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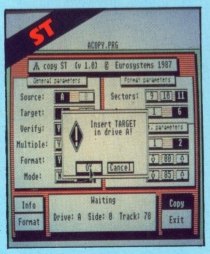

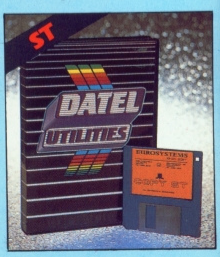

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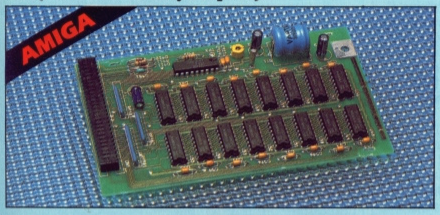

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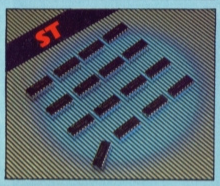

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The complete package for Atari ST and Commodore Amiga owners

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DISK EXTRA
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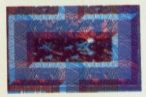
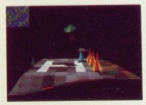


GAME BUSTERS 56
The biggest games cracked: *Virus* and *Pandora* laid bare, plus a stunning make-your-own map kit for *Dungeon Master*.



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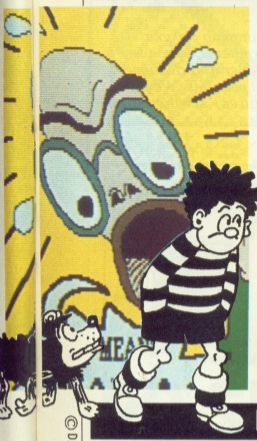

CARTOON CAPERS

You don't need £1000-worth of hardware and software to create great pictures – just a little know-how. Learn the inside secrets of the cartoonist's trade.

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The ultimate Amiga slide show program arrives – mix music with some amazing video effects and run your own art show.

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EUROPE ONE, USA NIL?

Normally we're used to reading stories in the press about how this or that superb British innovation has been woefully neglected by the government, and the inventors have swanned off down the brain drain to the US of A to find fame and fortune.

With the Amiga and the ST, Europe is finding itself in a rather ironic situation – we're nicking the best the States has to offer!

Consider the facts: in 1985, the dominant machines over here were the Speccy and 64. In America, Atari and Commodore were preparing to launch their 16 bit supermachines on an unsuspecting world.

To start with, Europe were the poor relations. We gaped at the graphics and gasped at the games, but the machines were in very short supply; all the software dribbled over the Atlantic when they could spare it, and then at extortionate prices.

But now it's all changed. The ST largely flopped in America, and the Amiga has virtually become a specialist graphics workstation. But over here they're flourishing: there are probably more STs in the UK than in the States, and Commodore dominates the German and Scandinavian markets totally.

What does all this mean? It means more software for us, better support, better supplies and lower prices, because at long last programmers over here are getting to grips with the machines. Electronic Arts have released *Fusion*, their first all-UK game, this month.

With a worldwide user base of over a million between them, the future for the ST and Amiga looks pretty rosy. And that can't be bad.

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SELL YOURSELF! 34

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Entry forbidden to all Amiga owners – here's where the ST's innermost secrets are revealed.

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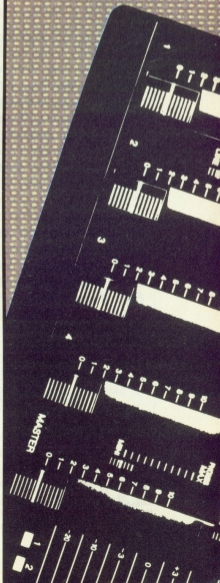

Devpac Amiga Version 2

The Best just got Better!

Devpac Amiga has always been the popular choice for assembly language programming on your Commodore Amiga. When it passed its second birthday we took a fresh look at it and realised there were a few things it didn't do that we, and you, wanted it to. So we re-wrote both the assembler and debugger totally from scratch, allowing us to add features that were not possible in the original versions. We then substantially improved the editor as well to give us an unbeatable combination of features - see the table.

The Editor - true integration

The fast editor is based on the original but with extras like block highlighting, a file requestor and the ability to make backups of your source files. The assembler and debugger are both available, instantly, at the press of a key.

The Assembler - no waiting zone

GenAM was always fast but the all-new algorithms means it's even faster, particularly on larger programs. It handles multi-hunk code, 127-character significant labels, local labels, improved macros & conditionals, generates directly executable, or linkable code, and a stand-alone version is included so you can use a CLI, a batch file or an alternative editor.

The Debugger - kills bugs, dead

How many times do you write a completely bug-free program? Trying to debug a program by looking at guru numbers is what some development systems leave you to do. We include a disassembler/monitor/debugger called MonAM, which uses its own screen display, leaving your program's output alone. It has a range of different types of breakpoints including count and conditional breakpoints. For example you can stop after the 24th call to print or stop if the contents of mem_ptr become odd. You can also break into runaway programs, or you can even view your source-code files from within the debugger and use multi-hunk program symbols.

Ideal for Beginners & Enthusiasts

The editor is fast and easy to use, you can assemble from memory to memory then execute it repeatedly to try your ideas out, all without a disk access. Press a key and you're straight into the debugger, you can even debug programs assembled to memory with their original symbols. No linking is required - the assembler can generate directly executable programs immediately. Interested in hacking somebody else's code, such as the ROM? - with the debugger you can disassemble to disk with automatic labels, including system calls. All programs will work on a 60-column display.

Ideal for Professionals

If you're not using Devpac for software development then you'd better hope that your rivals aren't either. Why wait for your editor to load a file or for your assembler to churn through it - GenAM is the fastest professional assembler available and is fully source code compatible with the MCC assembler. We write in 68000 assembly language every day so we understand what you need.

Ideal for You

Just compare the specification with any other product and we're sure you'll agree

Devpac Amiga 2 - There is No Competition

	DevpacAm 1	MCC Asm	K-Seka	DevpacAm 2
Screen Editor	Y	Y	N	Y
Handles tabs as single chars	Y	N	N	Y
Step through assembly errors	Y	N	N	Y
Automatic backups	N	Y	N	Y
Integrated assembler	Y	N	Y	Y
Integrated debugger	N	N	Y	Y
Macro parameters	10	10	9	36
Multi-line macro calls	N	N	N	Y
Conditional assembly	Y	Y	Y	Y
Case flexible	Y	Y	N	Y
Local labels	N	Y	N	Y
Executable, relocatable code	Y	N	Y	Y
Linkable code	Y	Y	N	Y
Multi-SECTIONs	N	Y	N	Y
INCLUDE binary files	N	N	N	Y
Assemble to memory	N	N	Y	Y
Stand-alone assembler	Y	Y	N	Y
Section types	Y	N	N	Y
Debugger supplied	Y	N	Y	Y
Disassembler	Y	N	Y	Y
Multi-window	N	n/a	N	Y
Source-code viewing	N	n/a	Y	Y
Single-step	Y	n/a	Y	Y
Breakpoints	Y	n/a	Y	Y
Conditional breakpoints	N	n/a	N	Y
Full expression evaluator	N	n/a	N	Y
Multi-screen	Y	n/a	N	Y
Break into running programs	Y	n/a	N	Y
Disassemble to disk	N	n/a	N	Y
Example program source code	Y	Y	N	Y
Operating System libraries	Y	Y	N	Y
Version	1.2	11	1	2.0

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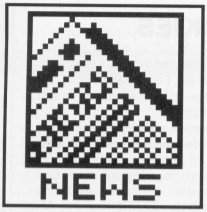
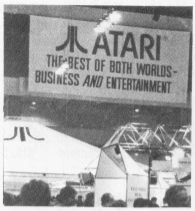
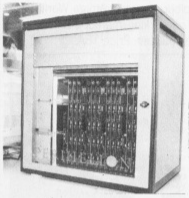
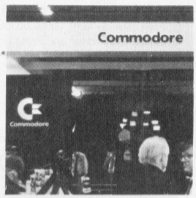








■ *The PC Show 1988 – spot the Atari and Commodore villages; the Microprose supershuttle taking off for a trip through space (boy, the queues for that, but it was worth it!); the Future Publishing stand thronging with readers; and the latest manifestation of Atari's Abaq, the mega-Mip transputer farm known in the trade as 'The Microwave'.*

PC SHOW BRINGS 'EM IN

The 1988 Personal Computer (PC) Show duly came and went at Earls Court, running from 14th to 18th September. *ST Amiga Format* were there in force, both manning our stand to meet you lot, and sniffing out the newest product announcements.

Desktop Video for Amiga

Commodore are to release a video editing kit later this year, based around the Amiga A500 and priced at below £500.

At last the potential of the Amiga's graphics hardware looks set to be realised, and with over a million video recorders in homes around the UK this could be a winning marketing strategy for Commodore.

The idea is that you can link up your Amiga to a domestic video recorder and use it to edit and mix in computer graphics with conventionally recorded images. Applications range from adding captions and labels to granny on holiday, right up to directing your own pop video.

Until now you needed to buy a special piece of hardware called a 'Genlock' at around £200 to make the Amiga-video recorder link work, but Commodore have worked out a cheap deal with Applied Systems and Peripherals to build a suitable unit.

Software bundled in the kit will be Zuma's *TV Show* and *TV Text*. Barry Thurston, Sales Director at Commodore, reckons the price of this will be £499-ish, which looks pretty good value.

Record companies of the world can now cringe at the prospect of receiving promo videos alongside demo tapes!

16-bit shock!

Mmmm! Listen to this for a spec for a brand new price-busting-performance-searing 16-bit wonder-machine:

- 512K of RAM expandable to a massive 640K maximum
- Speaker with volume control, capable of producing both quiet beeps and loud beeps (one tone only)
- Two expansion slots
- Standard graphics mode display has a dazzling 4 colours
- Price with colour monitor: a snip at £573.85 inc. VAT

"What can this be?" you ask, getting out your chequebook and setting off to place your order at Dixons. Answer: the new *Sinclair Professional PC200*, from Amstrad, only available at Comet.

The idea is that an IBM compatible games machine will appeal across the spectrum (ho, ho) of business and leisure users, thus selling in millions. Until now, everything Alan Sugar has done has turned to gold. Could this be his first mistake?

After all, even if you run your computer through a TV and do without the monitor the PC200 costs £299 *plus* VAT: that's £44.85 more than a list price ST, and £55.15 less than a list price Amiga. And you can usually find discounted STs and Amigas, whereas Amstrad models almost invariably stick to their list price.

In short, no regrets for recent ST or Amiga buyers. The sad thing is that Amstrad's slick marketing campaign which will undoubtedly run up to Christmas may well lead some people into a serious mistake.

ST cut official

As revealed way back in issue 3 of *Format*, Atari used the Show to announce a price cut of £100 on the ST.

A basic 520ST with a 1MB disk drive (this larger size is the only one now available) is down to £299, and there's also the 'Super Pack' at £399. This consists of a 520ST bundled with what claims to be £450 worth of software. The final 22 titles chosen by Atari are: *Marble Madness, Test Drive, Beyond the Ice Palace, Buggy Boy, Eddie Edwards Super Ski, Ikari Warriors, Thundercats, Ranarama, Zynaps, Quadralien, Starquake, Chopper X, Roadwars, Xenon, Arkanoid II, Wizball, Black Lamp, Genesis, Thrust, Seconds Out, Summer Olympiad 88*, and one non-game package, Triangle's *Organiser* – a notepad/diary utility.

Other ST models – 1040 and Megas – aren't changing in price,

but then they didn't go up when the 520 rose last Spring. However, the 1040 is now coming with a built-in TV modulator as standard, worth £30 at old prices.

Atari reckon there are 120,000 STs in the UK at present, and aim to make that 200,000 by Christmas – think big, guys.

Amiga push

Commodore have been unable to respond in kind to Atari's price cut. After all, they did knock £100 off the Amiga only few months back. However, the incentive to Autumn buyers is that all Amigas sold from November 1st will include a free TV modulator – the widget that used to cost £24.99 that was necessary to link up to a TV.

Commodore's boss Steve Franklin admitted that they had thought of doing a games software deal. However, the economics would have pushed the A500 over £400. "We'd rather keep the price of the A500 down than include a deal with probably only two or three really good titles," he said.

Joy for Amiga programmers

HiSoft, that prolific source of joy to programmers, have begun to assault the Amiga market in a big way.

Best news is of a compiler for Amiga BASIC. Due out around the end of October, *HiSoft Amiga BASIC* will cost £99.95. It claims to compile both industry-standard Microsoft BASIC compatible programs and ordinary Amiga BASIC programs unchanged.

HiSoft BASIC includes an interactive editor, so you are immediately returned to the correct point in a program when an error is discovered, and programs can be compiled to complete stand-alone machine code. Not only will they be faster than the standard interpreter, you'll be able to sell your creations as a single clickable icon.

Also due out, for the more inveterate hacker, is *Devpac 2* for the Amiga. Version 2, which was released on the ST a couple of months ago (see issue 2) comes at £59.95 and features a completely integrated edit-link-debug cycle.

■ *Hisoft, The Old School, Greenfield, Bedford (0525 718181)*

Animators' delight

The Amiga's pre-eminence in computer animation and interactive video continues to grow with several new products.

Top of the range is *Sculpt 4D Professional*. At £368.00 inc VAT this is a professional ray-tracing package with a feature list as long as your arm: a protractor for measuring angles; keystroke macros; metal, glass and mirror textures; the omnipresent but obscure 'Phong shading'; support for 68020/030 processors; genlock interface, and much more. Anyone who's used to Sculpt 3D will know the quality to expect from the new version.

Forms in Flight 2 (£79.00) and *Fantavision* (£39) are two budget-priced packages. As well as the usual animation features, F-in-F allows you to do 'texture mapping' – wrapping an IFF picture around a 3-D shape; Fantavision is an *Aegis Animator*-basher, claiming much the same facilities at half the price.

■ *Amiga Centre Scotland, 4 Hart Street Lane, Edinburgh EH1 3RN (031-557 4242)*

Public service

If you're bewildered by the vast number of Amiga PD disks out there, George Thompson Associates are providing what looks to be a good way of finding your feet.

For £4.99 you can get two disks with a complete catalogue of Amiga public domain, covering the Fish, Amicus, FAUG and TBAG libraries, as well as a few special compilations. Also covered is a taster of the popular American magazine-on-a-disk, *Jumpdisk*, in the form of a back issues listing and a sample of its articles, hints, tips and programs.

To whet your appetite, the catalogue pack includes a fully playable 3D Asteroids clone game, *Orbital*, complete with 3D specs.

You also get a £5 voucher, redeemable against a purchase of 10 or more PD disks (normally £3 each) – so you stand to make a net gain of 1p on the deal!

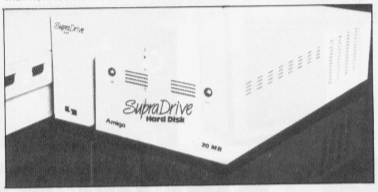
■ *George Thompson Associates, Freepost, Dippen, Brodick, Arran, KA27 8BR (0770 82 234)*

QUICKIES

■ **The ST Club** are expanding – as well as moving premises to Sutton Place, 49 Stoney Street, Nottingham NG1 1LX, they are marketing their first commercial product. **Fontkit Plus** costs £9.99 (£8.49 for a double-density disk version) and allows you to edit all GEM or Degas screen and printer fonts.

■ **George Thompson Assoc-iates** are releasing a tutorial book to sharpen your Amiga art skills. **Professional Results with Deluxe Paint II** is a hardback crammed full of hints and tips on basic art techniques, colour cycling, screen photography and more. Cost is £24.95, or £44.95 inclusive of two disks of examples and tutorials.

■ **Hi-Tension** (0734 761159) have developed a neat little Amiga hack, allowing you to display 16 colours on your Amiga Workbench screen. The system takes up 30k of working memory, and comes with new Icon Editor and Preferences utilities. Price TBA...



■ *Frontier's new deal brings their Supra hard disks to the Amiga*

■ **Frontier** (0423 67140), longtime distributors of Supra hard disk drives for the ST, have now clinched the distribution deal for the Amiga Supra range too. 20MB, 30MB and 60MB drives are available, the smallest at £649.95 (A500/A1000) and £629.95 (A2000).

Deeply touching

EC Computers have developed a new way of using your ST. Throw the mouse away, just point to what you want with the new Touchscreen.

Eagle's touchscreen is a transparent overlay which clips on the screen and plugs into the ST, after which pointing at an item on the screen is exactly equivalent to clicking the mouse button on it.

The screen consists of two facing mylar sheets, with a very slight gap. When you touch it, an electrical connection between the sheets is made.

The unit has a resolution of 256 by 256, and retails for £399 inc. VAT. You'll never quite match the mouse for pixel-accurate drawing ability, but Eagle reckon it will go down a storm with physically handicapped users, schools and dealers who need to give demonstrations to an eager audience.

■ *EC Computer Exhibition Centre plc, 2nd Floor, Glamorgan House, David Street, Cardiff CF1 2EH (0222 390286)*

Top of the charts

Mandarin Software's ST games designer, *STOS*, has achieved a unique first in the heady annals of software history by being the first non-game to top the Gallup sales charts.

Imagine what you'd think if on *Top of the Pops* next week Debussy went straight in at number one with his latest symphony. (OK, so he's dead...) STOS, coincidentally also a French-originated piece but otherwise unrelated, topped the Gallup ST sales charts after only its first week in the shops. It outsold all games, dislodging Firebird's *Virus*, the previous week's best seller.

clik

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SOFTWARE LIST

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Aaargh	Melbourne House	19.99	13.50
Adventure Con Set	Electronic Arts	29.99	20.50
Alien Syndrome	Softek	24.99	16.50
Annals of Rome	P.S.S.	24.99	16.50
Arcade Classics	Robtek	19.99	13.50
Arkanoid	Discovery	26.00	16.00
Armageddon Man	Martek	19.99	14.50
Army Moves	Ocean	24.99	16.50
Artic Fox	Electronic Arts	24.99	17.50
Badcat	Rainbow Arts	19.99	16.00
Balance of Power	Microsoft	29.99	19.50
Barbarian	Palace	24.99	16.50
Bards Tale 1	Electronic Arts	24.99	17.50
Bards Tale II	Electronic Arts	24.99	17.50
Bermuda Project	Melbourne House	24.99	16.50
Better Dead Than Alien	Elektra	19.99	13.50
Beyond The Ice Palace	Elite	24.99	16.50
Bionic Commandos	U.S. Gold	24.99	19.50
Black Lamp	Firebird	19.99	13.50
Blac jack Academy	Microillusions	19.99	13.50
Bomb Jack	Elite	24.99	16.50
Bubble Bobble	Firebird	19.99	13.50
Bubble Ghost	Ere Int.	19.99	13.50
Buggy Boy	Elite	24.99	16.50
Carrier Command	Rainbird	24.99	19.50
Championship Golf	Gamestar	34.99	27.75
Chessmaster 2000	Electronic Arts	24.99	17.50
Chubby Gristle	Grandslam	19.99	13.50
City Defence	Anco	14.95	10.25
Coruption	Rainbird	24.99	16.50
Crack	Level	19.99	13.50
Craps Academy	Microillusions	24.99	16.50
Crash Garrett	Infogames	24.99	16.50
Defender of the Crown	Mirrorsoft	29.95	19.50
Deja Vu	Mindscape	29.99	19.50
Division One	Robtek	19.99	13.50
Ebontair	Microillusions	24.99	16.50
ECO	Ocean	24.99	16.50
Elf	Tynesoft	14.99	10.25
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Empire	Interstel	24.99	17.50
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HARDWARE LIST AS FROM THE 1ST OCTOBER 1988

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A500 (As Above) with 1084 Colour Monitor 699.99 620.00
A500 Business Pack 803.85 750.00
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MPS1200C Disk Drive 140.99 125.50
1084 Colour Monitor 749.99 690.00
1084 Colour Monitor & T.V. Tunder 305.99 287.00
T.V. Tuner 99.99 91.50
Cumana Amiga Drive CAX 354 99.99 91.50
Cumana Amiga Drive INC P.S.U. CAS 354 150.99 125.00
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A200 SPECIAL OFFER (WHILST STOCKS LAST)
A2008 Computer with 1084 Colour Monitor
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Citizen 120D Printer Ribbon	9.99	3.50
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Disk Drive Head Cleaner	14.99	8.50

Not-so-Mini Office II

Mini Office II, the staggeringly successful budget software suite which has progressed from BBC through CPC, PCW and PC, is now arriving on platform 5 for the ST.

Comprising a word processor, spreadsheets, database, comms suite and graphics editor, the confusingly named Database Software hope their other-formats success will be repeated.

However, they seem to have abandoned the budget ground for a grander image. Past versions of Mini Office have cost £19.95 (Amstrad CPC), £29.95 (Amstrad PCW), £49.95 (PC) – but the ST version will be £29.95 *per module*. That's £149.95 the lot! At £20 or so people are prepared to forgive a few bugs, but it's going to have to be good at £150.

■ *Database Software, Europa House, Adlington Park, Adlington, Macclesfield SK10 4NP (0625 878888)*

The shows go on

How many computer shows can you fit into one year? How many angels fit on the head of a pin? If you didn't make the PC Show, don't fret – shows for both ST and Amiga owners are scheduled for November, ideal for picking up those Christmas bargains.

The *12th Official Commodore Show* takes place at the Novotel, Hammersmith, between November 18th-20th, closely followed by the *Atari Christmas Show* at Alexandra Palace from November 25th-27th. Hardworking Database Exhibitions are organising them both, and hardworking journalists like ourselves (ermm...) will be among the crowds at both.

Prime attraction at the Atari Show is a games workshop: if you fancy yourself as a games writer, this could be your chance to make a million. Write your program and take it along to the show, where reps from US Gold, Mastertronic/Virgin and Tynesoft will give you advice on design and presentation, or even make you an offer if it's really good!

Meanwhile Commodore are offering prizes in a Christmas Card design competition – take your disks along and win a prize – plus special graphics and games rooms with major demos running all the time.

■ *Database Exhibitions, Europa House, Adlington Park, Adlington, Macclesfield SK10 4NP (0625 878888)*

Eeek! It's Mouse Music

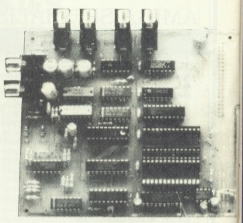
Eidersoft are setting out to prove that the ST can outplay an Amiga when it comes to sound sampling.

Mouse Music, previewed at the PC Show, is a 4-Channel sound sampler and sequencer for the ST. You can get sampling rates of up to 44.1 kHz, which is the same as CD players use. It will take samples in 8-bit mode (below 16-bit CD quality), but can replay in higher quality 12-bit mode. Eidersoft plan to supply a disk of 12-bit samples for you to edit into your own pieces, but you can't directly sample at 12 bits.

Mouse Music plugs into the cartridge port, and the software can optionally be fitted in ROM, freeing you from carrying disks around with you to live shows.

Mouse music will be sold at £179, or a special deal with a keyboard at £249. (A keyboard for £70 doesn't sound bad.) First sales are planned for the Atari Show, November 25th-27th.

Amiga owners needn't despair though – a version of Mouse Music is well under way, which will sample on *eight* channels!



■ ***Eidersoft's Mouse Music board in prototype form at the PC show***

■ *Eidersoft, Unit D7, Royal Mills, Esher, Surrey KT10 8AS (0800 581 742)*

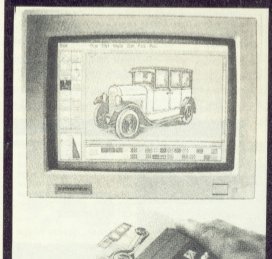
A SCANNER IN THE WORKS

Two new ways of getting images into your computer were unveiled at the PC show.

The *Cameron Handy Scanner* is a 16-grey scale, 64mm wide digitiser. It looks like a fat mouse, and to use it you place the sheet to be scanned on a flat surface and sweep the scanner over it.

If your image is more than 64mm wide, you need to do several sweeps and compose the image with a graphics editor.

A nice addition is 'OCR' software – Optical Character Recognition. It you scan a page of text, the pixels from the image can be processed and recognised as letters of the alphabet. This means the graphic file can be converted to ASCII text for treatment by a word processor. The reliability of the OCR conversion depends on text size and the kind of typeface used – you can teach the software new typefaces, but it won't work below 8-point text size (Format's body text is 8-point text). It should, however, scan typed pages quite well when set up properly.



■ ***The Cameron Handy Scanner in action***

■ ***Eye, eye, what's all this then? a sample from Rombo's Vidi ST***

The 16-grey scale Handy Scanner is available for both ST and Amiga at £343.85 inc. VAT. A cheaper 2-grey scale model (black and white only) costs £228.85.

Meanwhile, an exciting new digitiser was on display from Rombo: *Vidi ST* takes black and white images from video cameras in 'real time'. This means it can grab a single 1/50th second image without you needing to freeze the motion.

You can store frames at a claimed rate of 12 per second (that's real movie speed), edit the images you've grabbed and replay them at up to 25 per second. Up to 24 frames can be stored on a 1Mb ST. All this for only £99.95? Can it really be true? – Yes.

■ *Cameron UK, 108 New Bond Street, London W1Y 9AA (01-499 9191)*

■ *Rombo Productions, 107 Raeburn Rigg, Livingston EH54 8PH (0506 39046)*

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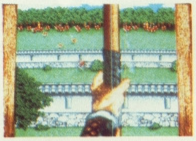
QUEUE FOR ACTION

Bewildered by the billions of new games announced at the PC show? Andy Storer battled through the crowds to find the truth behind the hype, and presents the best of the month's upcoming games on ST and Amiga.

LORDS OF THE RISING SUN

Cinemaware/Mirrorsoft ■ Amiga & ST ■ £TBA



The follow up to *Defender of the Crown* and Cinemaware's most ambitious project to date is a real-time arcade adventure set in 12th century Japan with you in command of vast armies of Samurai taking on Ninjas in an all-or-nothing attempt to become Shogun. As you might expect, the interactive graphics and animation are going to be out of this world.

PIONEER PLAGUE

Mandarin ■ Amiga only ■ £19.95

Proudly announced as 'the world's first 4,000 colour mode game', Pioneer is the only game to date developed using the Amiga's 'HAM' graphics capability and comprises eight directional scrolling, digitised speech and stereo music. You're after a self-replicating, terraforming robotic probe that's got its wires crossed in a mix of multi-level arcade/strategy. The hyper-fast fractal sequences have to be seen to be believed.

DAMOCLES

Novagen ■ ST & Amiga ■ £TBA

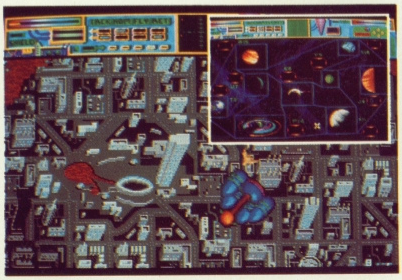
Despite rumours that the '88 PC Show demo was no different from the one of '87, the follow up to *Mercenary* will be out by Xmas. Really. After leaving Targ you make it to the Gamma planetary system where the comet Damocles is about to wreak havoc. And yes, it's up to you to avert disaster. Reputedly with 50 times more data than its predecessor, Damocles features fast solid 3D graphics.

AFTERBURNER

Mediagenic ■ ST & Amiga ■ £24.99

Argonaut's *Starglider 2* team bring you this compressed clone after stripping down the 3 Megabytes of the number one arcade game of the year to deliver a fast and furious 3D assault. Throw in stereo FX and you're left with a supersonic dogfight that aims to capture the thrills and spills of the original. Can you believe it's also out on the Spectrum?

■ *AFTERBURNER*



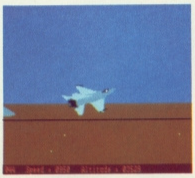
■ *PIONEER PLAGUE*

ROCKET RANGER

Cinemaware/Mirrorsoft ■ Amiga only ■ £29.99

It sounds like a *Sunday Sport* story: the Nazis win World War Two, then hang out on the moon manufacturing deadly bombs. A bunch of scientists from the future send you a rocket suit, a ray gun and a secret decoder wheel in the mail, whereupon you set off to rescue your childhood sweetheart and her scientist father before heading for the moon. Wacky or what? Be prepared for something special with this red hot coin-op conversion – stunning arcade action and a varied plot.

sions to complete against various MIGs. There'll also be a facility to challenge another pilot in machine to machine combat as you hit Mach 2 with a planeload of missiles, bombs and cannons.



■ *FALCON*

■ *ROCKET RANGER*

DRAGON-SLAYER

Linel ■ Amiga &ST ■ £29.95

A state of the art arcade adventure featuring over 300 locations in castles, forests and villages. It's pretty obvious from the title what your role is in the scenario – let's just say there's 50 different enemies some of whom occupy half the screen as a single sprite. And the animation we saw was something really special – the Amiga version will display 80 colours throughout, another demonstration that 16-bit horizons are being stretched.

FALCON

Spectrum Holobyte/Mirrorsoft ■ Amiga & ST ■ £TBA

Interceptor-style 3D graphics combine with multiple views in a simulator where you'll have 12 mis-

PACMANIA

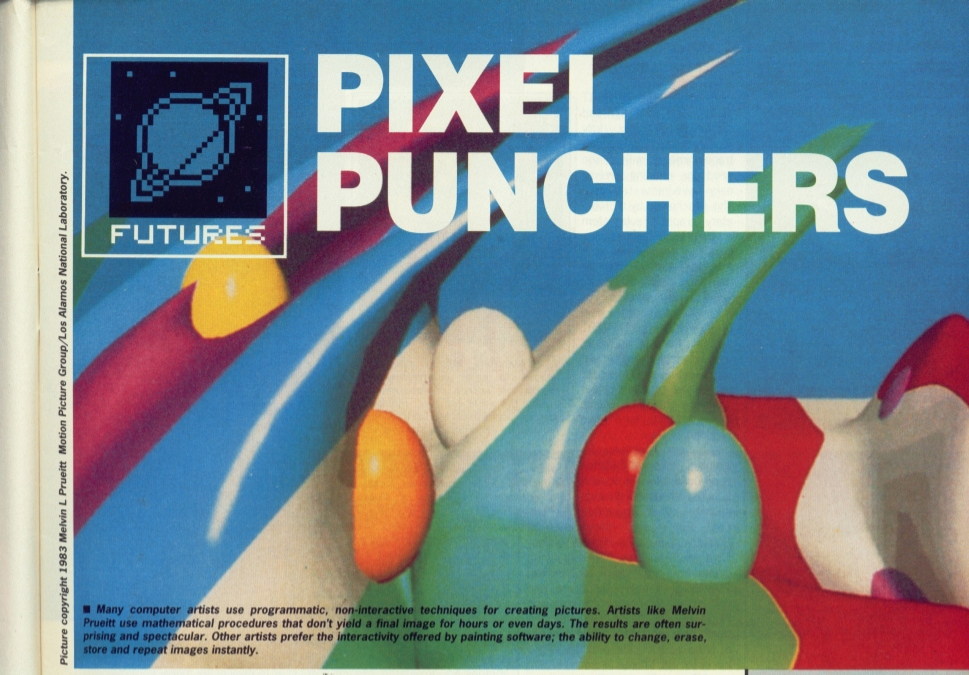
Grandslam ■ Amiga & ST ■ £19.95

Grandslam's great coin-op conversion comes your way in 64 colours with Pac Man himself in 16 shades as he works his way through the 22 levels. Worth a look for nostalgia at least as this pioneering figure of computer entertainment guarantees his rightful place in the 20th century's archives.

■ *PACMANIA*

FUTURES

PIXEL PUNCHERS



Picture copyright 1983 Melvin L Prueitt Motion Picture Group/Los Alamos National Laboratory.

■ *Many computer artists use programmatic, non-interactive techniques for creating pictures. Artists like Melvin Prueitt use mathematical procedures that don't yield a final image for hours or even days. The results are often surprising and spectacular. Other artists prefer the interactivity offered by painting software; the ability to change, erase, store and repeat images instantly.*

The graphics capabilities of computers are advancing apace; and the uses for so-called superworkstations are many: video titling, animation, scientific research, CAD, DTP. Richard Monteiro looks at the machines creating pixel masterpieces and graphics grandeur.

You'd be hard put to watch a day's TV without seeing some form of computer-generated art. Dozens of television adverts and programs use computer animation; travel agents, insurance brokers and estate agents use pixel pictures to display product information; some train stations and airports take advantage of computer graphics to inform travellers of arrival and departure times, gate numbers and other useful information.

The story doesn't stop there. Far from it. Computer imagery reveals the invisible. Computer graphics enhance images grabbed by medical scanners so doctors can really see what's going on. Much more data is available to the geologist on a computer screen than a seismograph. A computer-generated car can be driven into a computer-generated wall and the results observed by engineers without the cost of any auto hardware.

Early computers didn't have any graphics capabilities; output was generally through teletype printers or, at most, oscilloscope-like devices. Such limitations didn't prevent programmers from experimenting, however. In 1950 an operator on the EDSAC (Electronic Delay Storage Automatic Computer) at Cambridge University produced an image of a Highland dancer on one of the computer's oscilloscopes. A few years later Christopher Strachey at Manchester University programmed a computer to play draughts on screen. Humble beginnings indeed for computer-generated art.

Machines making movies

Perhaps the most-talked about, if not most-used, graphics system is Quantel's Paintbox. Several versions of this mega-system exist. The best known is Video Paintbox which is used by many television and video companies for generating real-time effects and superb introductory sequences. Cost for this system is betwen £80,000 and £100,000. Over 500 systems exist worldwide; with the UK having a 10% share. The BBC alone has 25 systems.

Graphics Paintbox is another of Quantel's babies; this one is used by the printing industry. It boasts an almost-infinite colour palette (colours can be mixed to produce new colours), resolution enough to create pictures of photograph quality and a £305,000 price tag. Unsurprisingly there aren't too many Graphics Paintboxes in the country – three or four according to Quantel.

It's all custom silicon inside Paintboxes: Quantel aren't keen to divulge any information on what makes the systems tick. But you can bet it's circuitry is pretty hot.

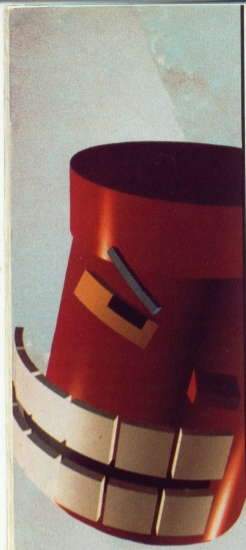
Technology like that afforded by Paintbox is constantly dropping in price. Silicon Graphics, for instance, manufacture a workstation by the uninspiring name of 4D/80GT. This machine boasts a 16.7 MHz RISC processor functioning at 13 MIPS, 380Mbyte hard drive, 19" 1280 by 1024 colour monitor and 8 Mbyte of memory. It runs Unix Version 3 with X-Windows and Sun's *News* windowing

COMPUTER

GRAPHICS EXHIBITION

The 1988 Computer Graphics show is to be held at Wembley Exhibition Centre, London, between October 11th and 13th. Show hours are from 10am to 6pm except Thursday the 13th when opening times are from 10am to 4.30pm. All that is state-of-the-art in graphics is promised for display. Tickets cost £5 and are available from Blenheim Online (01-868 4466). Under 18's not admitted.

GRAPHICS 88



MAD BASTARD

Wired, C4's magazine follow-up to *The Tube*, has a 50-second introduction featuring a skeletal automaton crashing though a ghost town. 'Mad Bastard' is the name of the hell-raiser affectionately animated by Digital Pictures. The budget for the title sequence was a mere £50,000. Bank adverts using computer animation can cost half a million pounds.

environment. The 4D/80GT allows users to design and manipulate complex, fully rendered and fully lit (ray-traced) images without the need for creating preliminary wire-frame designs. This is achieved by a proprietary graphics sub-system coupled to the processor – basically, it's one hell of a machine, and all for the merry fee of £68,000.

Still too pricey? For £30,000 you can get hold of the Video Paint VP101 system. Painting software, graphics tablet, anti-aliased fonts (curves don't appear jagged due to subtle colour shading), internal genlock and 40 Mbyte hard drive included.

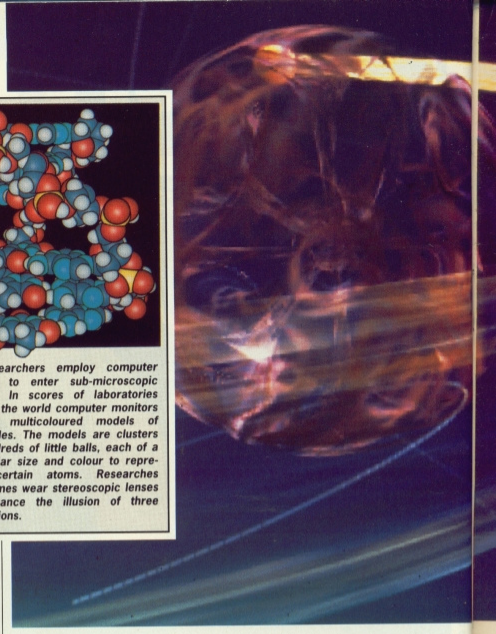
The next best thing to a graphics superworkstation – if you don't have several hundred thousand pounds spare – is an expansion card for your micro. Something like the Falcon Colour Card which features 256 colours on screen from a palette of 16.7 million, 2Mbyte of memory, hardware pan and zoom, on-board firmware and HD64180 processor. Currently the board only interfaces to IBM PCs, but at around £3000 this probably isn't a worry for most home users.

CIT based in West Germany have two graphic-expander boards for the Amiga. MegaVision 02 is available now and offers a one megabyte frame buffer, non-interlaced 800 by 600 resolution (1024 by 760 interlaced) and 256 colours on screen from a palette of 256,000. No design software exists for the system, but libraries are provided if you are interested in developing your own software. Cost: around 3000 Deutschmarks (£1000).

Creative Age 2016 – ready real soon – is an A2000-only board with graphic processor running at 20Megs, heaps of video RAM and the same colour capabilities as the Amiga. So what makes the thing so special? 1024 by 760 non-interlaced mode and the possibility of speeding up Amiga drawing routines by redirecting vectors to the 2016. Price for this model is expected to be between 3000 and 4000 DM. Pay extra and you can will receive the same board with extra memory and better resolution. CIT can be contacted at Maaffenstr No. 10, 4235 Schermbeck, West Germany (010 49 28534099).

And, of course, there's the oft-mentioned ParSec board. An ST version is due out first with an Amiga model following fast (more on the board elsewhere).

■ ***Researchers employ computer images to enter sub-microscopic realms. In scores of laboratories around the world computer monitors display multicoloured models of molecules. The models are clusters of hundreds of little balls, each of a particular size and colour to represent certain atoms. Researches sometimes wear stereoscopic lenses to enhance the illusion of three dimensions.***



PIXEL BOOM FOR THE ST

Elmtech Research's ParSec board (first announced four months ago) has had its specifications changed and according to David Encill, head of Elmtech, is "realistically three to four months away."

A 32-bit, 40Mhz TMS 34010 processor (aka GSP – the Graphic System Processor) running at 6.125 MIPS (million instructions per second) is the heart of the machine. Based around Texas Instruments' SDB (Software Development Board), the ParSec will be offered in three versions: Colour+, Pixel+ and Text+. Colour+ will provide 1024 by 512 resolution, 4096-colour palette, 16 colours per line and 768k of VRAM (video RAM). Pixel+ will be an optional board for Colour+ which boosts resolution to 1024 by 1024, provides a 16,777,216-colour palette, allows 256 colours per line and features 1.5Mbytes of VRAM. Text+ won't be capable of colour-processing as it is intended for professional word processing and DTP use. Software will be fitted internally on ROM.

The unit will be housed in an extruded aluminium case, strong enough to support a monitor, with anodised front and rear panels. A multi-sync monitor is necessary to display the high resolutions on offer (another £500). The highest resolution will require an A4 Megascreen costing a cool £1200.

Several software packages are being written for ParSec including a CAD system, car and flight simulator, and a Quantel Paintbox-like program. The graphic package is claimed to offer better facilities than the Quantel system, including chalk, oil and water colour emulation, intelligent frame image filling and animation.

ParSec will come with a SCSI interface and will have provision for expansion boards. Proposed expansion units include sound generation, a Genlock, a video digitiser and a frame buffer. There's no definite price for the board, yet, but it's likely to be around the £600 mark. An Amiga model is planned.

Graphic techniques

There are two fundamentals for creating computer graphics: modelling and rendering. Modelling (wire-frame drawing) requires the artist or designer to enter structural information: which lines join to particular points, where a sphere attaches to a cube, what radius is given to a circle. Rendering (filling) forces the computer to display the model complete with colours, textures and shading.

Many wire-frame drawing packages use the schoolchild technique of creating cubes: two squares are overlapped, the corners joined with parallel lines and the edges normally hidden by the front surface removed. A better method can be found in solid-modelling systems which are essentially wire-frame drawing programs with surface recognition and automatic hidden-line removal. Yet another method of producing models, constructive solid geometry (CSG), works by having a set of basic objects. The user can build new shapes by adding several primitives together. The final step is to add colour and emphasize the object's three-dimensionality.

Imitating the random quality of nature is possibly the most difficult task for computers to undertake. Flames, irregular branches of trees, fissures in mountains and swaying fields of corn are among the many items that solid-modelling programs haven't a hope of handling. Drawing each limb of an oak tree or every crack in a wall would consume far too much processor time – not to mention artist's time. Programs are available for drawing trees and flames; these have pre-programmed images and simply spew them onto the screen according to the designer's directions. Realism is simulated by the program's in-built randomness.

■ *Yoplait "Fraid on a Ridge" TV commercial, designed by Harry Dorrington at the BBC and animated by Digital Pictures, demonstrates the ease with which computer animation and live action can be mixed to produce a convincing vignette.*

has 36,000 frames entirely generated by computer. A Cray X-MP (which costs around £10-million) – with painting software featuring a 70 billion colour palette, multiple light-source ray tracing, and rendering functions capable of introducing blemishes into objects – was used to achieve the realism. It still took it 2.5 minutes per frame, though!

CAD is a fast-growing area that makes extensive use of silicon-created graphics. One particular group of architects in Chicago can stroll down Michigan Avenue without leaving their seats. Their computers generate a complete 3D model of Chicago by drawing from a massive database that includes the outer dimensions of every structure. CAD isn't just restricted to wire-frame creations: computers can generate a model finished in wood, brick, stone or marble – the correct colour and texture of the material will be displayed by the computer.

Other areas where computer graphics play an important role include CAE (Computer-Aided Engineering), CAM (Computer-Aided Manufacture), DTP, simulators, satellite-data enhancing (weather maps, thermic maps and deep-space visuals), analyzing digitised images of athletes, brain-scanning equipment and sub-microscopic research.■

LOADSA-COLOURS

A computer's palette is determined by the size of the machine's colour register. Register size is measured in binary bits. Hence a computer with an 8-bit colour register will have a palette of 256 colours (256 is the largest value that can be held in eight binary digits). The ST palette is 512 colours and the Amiga's is 4096 colours. Many workstations offer a palette of 16.7 million colours: that's the largest number that will fit into 32-bits.

Usually only a fraction of the total number of colours offered by the palette can be displayed on screen. Memory and resolution are the governing factors. The total number of colours that can be represented on screen depends on the number of bit planes (just a fancy way of saying bits devoted to a particular pixel). For instance, if a computer has four bit planes, it can display 16 colours on screen at once. If, for instance, you have a 640 by 400 screen with 32 bit planes then you would need 1000K of video memory to support it (640*400*4 – remember there are four bytes in 32 bits).

▲ *BBC "Into '88" New Year title. Design: Harry Dorrington. Computer Animation: Digital Pictures.*
◀ *Cartoon-quality graphics are possible with Silicon Graphic's 4D-series RISC-based machines.*

Credible computer-created landscapes are possible thanks to the mathematician Benoit Mandelbrot. Fractal geometry – as his work is now called – is a technique for mathematically building landscapes and other natural-looking forms. Of course, semi-regular shapes that don't resemble anything on Earth are just as easily produced. Captain Blood, the exploration game for ST and Amiga micros, uses Fractal mathematics to generate random planet landscapes.

Ray tracing, a rendering procedure which evolved from software designed to determine how nuclear radiation passes through solid objects, arguably does more for a picture's realism than any other process. Ray tracing programs imitate the intricate play of light on a scene by calculating how countless individual rays are reflected from shiny surfaces, absorbed by dull ones, blocked by opaque objects and transmitted by transparent and translucent ones. Generating a ray-traced picture can take hours, even days, on even the most powerful workstation, but the results can be so realistic they are often mistaken for photographs.

Pixels at work

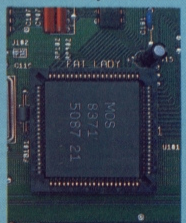
No matter what your TV-viewing taste, you're guaranteed to have seen some form of computer-created art. From the *Death Dance* of *Mad Bastard* in the opening sequence of *Wired* to the smooth scrolling titles of ITN's *News at Ten*; from the mixed computer graphics and live action of the Yoplait advertisement to the totally computer-generated Smarties advertisement; from the simple stills in *Catch Phrase* to the extravagant animations found in the latest Access adverts.

Even the Amiga is used for creating titles and other interesting effects for television programmes – like Network 7 and the Chart Show.

Big-screen films also use computer graphics. *Tron*, for instance, was the first film to include over 15 minutes of computer animation and a further 15 minutes of combined computer graphics and live action. Due to the huge amount of time needed to make the graphics sequences, the film went over budget; it's poor plot and weak characters ensured it wasn't a box-office smash. The *Last Starfighter*, which came later and consequently avoided many of the pitfalls of *Tron*,

AMIGA ENHANCED CHIP SET

Commodore are in the throes of producing an Enhanced Chip Set (ECS) for existing A500 and A2000 Amigas. The new chips will replace old faithfuls like Agnes (no relation) and Denise. All current video modes will be supported – meaning the resolutions and colours offered by existing Amigas will still be available. The new version of Denise will offer a high resolution 640 by 512 non-interlaced mode capable of four or eight colours. The exact number of colours isn't known yet, but will probably be four. The new Agnes, meanwhile, will be able to access one megabyte of chip memory rather than 512k.



Agnes takes care of animation and memory while Denise looks after resolution modes. A1000 owners are going to be left in the lurch, though, as the first Agnes chip was long and thin, while the tarted up Agnes (and the Agnes found in A500 and A2000 models) is square in shape. It's a fair bet that some third party manufacturer will produce a converter, though, which will allows the A1000 to enjoy the new chips.

A multi-sync monitor, which Commodore are also developing, will be needed to display the new mode. Although nothing firm has been confirmed by Commodore, it is likely that the ECS and multi-sync monitor will become part of their planned DTP push. Commodore are keen to keep the price of the ECS upgrade as low as possible. While no price has officially been set, industry commentators expect it to be well under £100.

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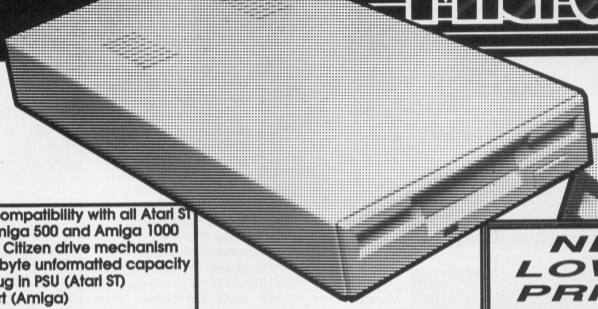

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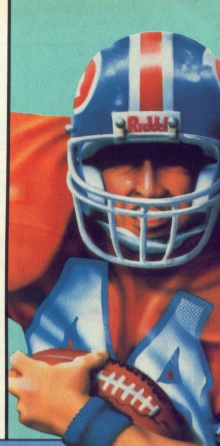
GRAPHICS

SPRITE FACTORY



Creating convincing animated graphics is one of the hardest tasks games programmers face. Richard Monteiro looks at a package designed to take the drudgery out of sprite creation, animation and implementation.

£49.95 ■ Colour STs only ■ Future Software Systems/CRL, 7 Kings Yard, Carpenters Road, London, E15 2HD (01-985 2391)

Joining the ranks of *Pro Sprite Designer* and the sprite creator bundled with *STOS*, *Sprite Factory* comes in a ring folder; the manual is staple-bound. Somebody somewhere screwed up. The package also includes two disks, containing the sprite generator, *Chameleon* (file conversion utility), demo programs and a folder full of compressed files. These expand to fill three, single-sided disks.

The minimum configuration necessary to run Sprite Factory is a 520 with colour monitor (or television). Only the 16-colour low resolution mode is supported.

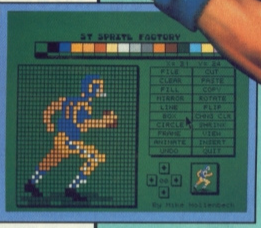
There are plenty of design options, which are all accessible from a menu box on the main design screen. FILE lets you load or save sprite data, palette information and animation sequences. Opting to load a file produces a prompt asking you to place the data in the data buffers FILE1 or FILE2. FILE1 is the active buffer in which all operations are carried out. FILE2 is used for copying or inserting frames into the active buffer.

CLEAR does the obvious. FILL produces another menu: 4-Way fills an area until it hits another colour without crossing a diagonal boundary, 8-Way fills in all directions, Fill All changes every pixel of a specific colour. Several options exist for drawing lines, boxes and circles. There are MIRROR, ROTATE and SHRINK functions. but oddly no expand feature exists.

Single sprites are stored in frames. The maximum size of a frame is 32 by 32 pixels – a limitation considering that the trend in games is to have huge, detailed sprites. Having a constant frame size means that animation is very easy. The animation section allows you to select up to 1000 frames in any sequence and then replay them. The software permits jostling of frames and altering of replay rate.

Sprite factory contains everything necessary for putting working sprites into your programs. Animation and collision detection are well provided for with tutorials and example programs on the disks. Sprite factory scores highly in most departments, but only works in low resolution, only allows sprites sizes up to 32 by 32 pixels and isn't cheap.

■ *Rotating, shrinking, flipping, shifting and other image-distorting features are readily performed on the large grid area.*



■ *The largest sprite you can create is 32 pixels by 32. Creating sprites is simply a matter of selecting a colour from the multi-coloured bar just above the large grid, and clicking the mouse pointer somewhere in the grid. A small grid displays the sprite at actual size.*

COLLISION DETECTION

The simplest way to detect the collision of two objects is to define a rectangle surrounding each object. Although this method is fast, it ignores the detail or curves in an object. An extension tothe boundary-detection method is to use a polygon with an increasing number of sides. Ultimately this technique allows a pixel-thin outline of an object.

OTHER GOODIES

A picture file conversion utility called Chameleon comes bundled with Sprite factory, which lets you cut graphics from Degas, NeoChrome, IFF or Sprite Factory pictures and incorporate them into your own programs.

Four archived files also come with the system. These must be un-archived with a program supplied before they can be used. You'll need a couple of extra disks to store all the uncompacted files. The extra files are MAPMAKER, JOYSTICK, SCROLL and GFADEMO.

Mapmaker can be used for creating large screens and maps using sprites as primitives. With MAPMAKER you can create a map consisting of 100 screens per level. Five levels are permissible – that's 500 screens of custom play-area packed into 60k!

The Joystick program allows you to check your sprites under joystick control. You can define the sequence for eight directions. When using this program look for smoothness of motion, speed of movement in all directions, realism and clarity.

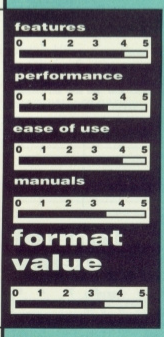
Scroll simply demonstrates smooth scrolling under joystick control, big deal, and GFAdemo is a demo that runs under GFA BASIC (V2).

for

- Tutorials on animation and collision detection
- Good sprite editing features
- Game map generator included
- Animations can have 1000 frames

against

- Limited sprite size
- Low resolution only
- Binder and manual don't fit together



GRAPHICS

FLIPPER

You've got plenty of time to create award-winning animations for next year's Amiga Animation Competition, but Hash Enterprises would still like to speed up the process for you. Richard Monteiro looks at their budget animation utility.

£42 ■ Amiga only, 1MB, two drives recommended ■ Hash Enterprises/Amiga Centre Scotland, 4 Hart Street Lane, Edinburgh, Scotland, EH1 3RN (031 5574242)

The Amiga Animation Competition sponsored by the Amiga Centre Scotland has been and gone. The event sparked off great interest in moving graphics and a repeat event is promised for next year. Commodore might be involved next time round and have been heard to mumble "TV coverage". Whatever happens, there's still the attraction of an A2000 first prize.

So what do you need to create animations good enough to win big prizes? If you're not into sleepless nights and intravenous coffee, *Flipper* could be a good bet. Flipper is another in Hash Enterprise's *Animation:* series, and follows on from *Stand, Multiplane, Effects* and *Apprentice.* Essentially, Flipper lets you create vignettes (short animation sequences). All you need is a selection of pictures created by an art package or grabbed by a digitiser; *Flipper* does the rest. All pictures in a sequence must be of the same resolution – You can't mix high with low resolution, four-colour with 32-colour images, or overscanned with non-overscanned.

Starting a script

The first stage in creating an animation – assuming you have a diskfull of pictures – is to create a script by selecting image files in the order you wish them to appear in the animation. The same picture can appear several times.

Once you've decided which pictures are to appear in the animation, you can determine how many times a frame is to repeat. Frames are displayed on screen for a 12th of a second and, not surprisingly, can be forced to repeat in 12th of a second increments.

The next operation involves packing the files detailed in the script. Two packing options exist: ANIM and HASH. ANIM is the standard used by other packages; it squashes frames more tightly and plays them back faster than the HASH technique. The only reason you might want to use HASH packing is to maintain compatability with other Hash products. Make sure you have a blank disk with plenty of free space for the compacted animation. Errors occasionally occur during packing, but no message appears informing you of the problem. This can be extremely frustrating as it can be a good few minutes before you realise something is wrong.

Animated action

A separate program on the disk plays back the compacted screens. And that's all it does, although certain key presses allow you to increase or decrease the playback rate.

It's a shame there isn't an option for creating stand-alone animations. Having an extra program to load and display the packed pictures is a bind. Admitted *Flipper* is half the price of most animation software, but even so it has few features.

ANIMATION SPEEDS

Some *Flipper* animations play back faster than others. This depends on the number of changes between each frame: the compression routine only saves the differences between pictures. Consequently pictures that differ greatly from frame to frame take up more memory and require a greater time to decompress. Completely dissimilar pictures will increase in size when packed, so you can't use Flipper as a slide-show program. (If that's all you want, try Vilbm given away on issue 2.)

features 0 1 2 3 4 5

performance 0 1 2 3 4 5

ease of use 0 1 2 3 4 5

manuals 0 1 2 3 4 5

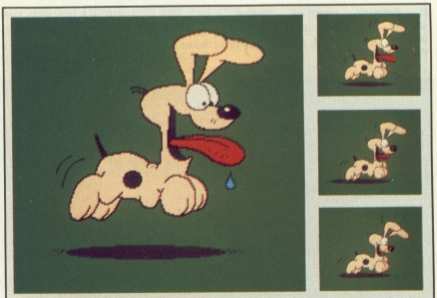
format value 0 1 2 3 4 5

for

- Reasonably cheap for an animation package
- Intuitive to use

against

- Errors in compacting not always displayed
- Can't create stand-alone animations
- Few features when compared with similarly-priced competition



■ *A sequence of picture files can be compacted and then displayed quickly giving the impression of animation. Complex pictures (those with lots of colours and lots of movement) don't compress well and slow down the animation process.*

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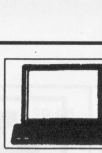

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HARDWARE

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Two methods for speeding up your ST. One involves a solder sucker, blitter chip and chainsaw. The other boots from disk. Richard Monteiro, with stop watch in hand, puts both to the test.

CAUTION!

If you manage to get hold of a blitter chip, you fit it at your own risk. As soon as you open up your ST your guarantee is invalidated. We've successfully blitterised our office Mega ST, but we won't be responsible for your mistakes!

Be wary of static electricity – it can cause many of your ST's chips to blow, consequently costing you hundreds. Carry out the work near water pipes or some other object that you're sure is grounded. Before you start hacking away at your machine touch the pipes. This will remove any static electricity that happens to be attached to you. Take care when handling the blitter; try not to touch any of the pins.

ST BLITTER CHIP

Anybody who has bought a Mega ST knows that they are supposed to have a blitter chip inside to boost their graphics; however, because of initial shortages Atari did not install them. Now that supplies are (just about) flowing, you can fit your own blitter and turbocharge your ST.

Your local dealer could probably fit the silicon slice... for a fee. If you've got a Mega ST2 or Mega ST4 then it's probably worth doing the operation yourself. After all, it only involves placing the blitter in a socket and removing two dabs of solder.

Carefully follow the captions to pictures 1 to 4, which show you the installation process. You will nee a pair of pliers, a soldering iron, a screwdriver and a solder-sucker. If you haven't got one of these, try your local electrical repair shop – they may lend you one. Alternatively take your ST down to the repair shop with this article – it's a two minute affair so it won't cost much; if anything.

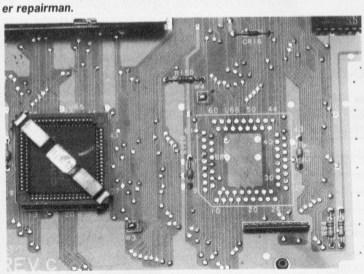
Once everything's back together and working, a new item, 'Blitter', in the 'Options' menu tells you that the blitter is functioning correctly. You can click on this item to switch the blitter on or off; a tick to the side of the option tells you that the chip is operative. Some programs won't work with the blitter – that's why the on/off function is present.

GEM automatically makes use of

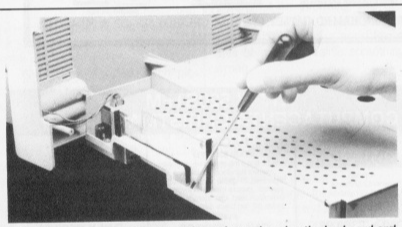
FITTING BLITTERS IN 520S AND 1040S

Early 520s and 1040s can't easily accept a blitter chip – there's no blitter socket and the firmware wouldn't recognise the chip anyway. The problem is less severe with later ST models. You can tell if your ST contains one of the newer versions as the years '1986/87' will appear in the Desktop Info box (accessible from the Desk menu).

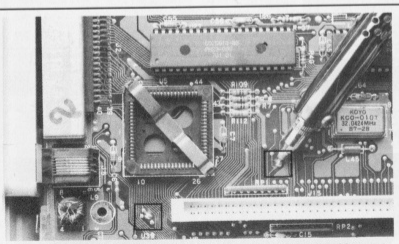
Unfortunately even new 520s and 1040s don't have a blitter socket – there's room on the motherboard for a socket though. The socket costs £4 and is available from most component suppliers. Don't, however, expect any information on fitting the socket: it's easy enough if you're experienced with a soldering iron and have nerves of steel; otherwise it's definitely a job for your local computer repairman.



■ ***Take this to your dealer. There are 68 holes to desolder before you can fit the blitter socket. And a further two (W3 and W4) after. But first you've got the protective shielding to contend with.***



■ ***1 – Disconnect your Mega from the mains and unplug the keyboard and any other items attached. Remove all the screws securing the two halves of the case, and gently remove the top half. A wire between the motherboard-shielding and top half of the case will prevent you from separating the two pieces immediately. Towards the left at the back of the micro you will find the wire attachment. Prise the connector apart. With a pair of pliers, straighten all the clips that hold the shielding to the motherboard. Remove the shielding to expose the circuit board – Bang goes your guarantee.***



■ ***2 – You'll find the empty blitter socket to the right of the cartridge port and above the 68000 processor. Look for two relatively large solder blobs. One can be found above a resistor pack (RP1) while the other is left of the internal hard disk socket. Hope you've brought a solder sucker with you.***

BLITTER VERSUS TURBO ST

The blitter chip and the Turbo ST program do different jobs. The blitter is designed to move blocks of data, preferably large blocks, at high speed. It does this very well. Turbo ST also moves blocks – but only character-sized blocks. The blitter is more versatile as it speeds up block-movement of any size, vertical and horizontal line drawing, and other GEM block-graphic functions. Turbo ST speeds up screen printing and rectangle fills.

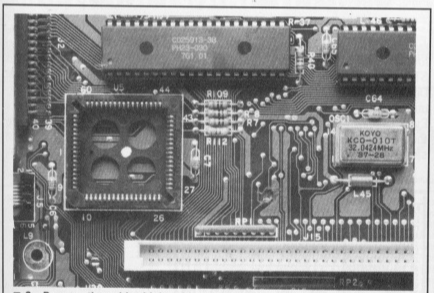
With a blitter installed you will notice that window –redrawing is faster (look closely). Turbo ST speeds up window updating (the speed at which text or icons fill the window).

We carried out some simple timing tests with the standard system, blitter-boosted system and Turbo ST-enhanced system. The tests measure the system under the best possible conditions; hence these are the greatest speed increases you're likely to get. In practice the gain will be less. Character printing to the screen with blitter installed results in a speed increase of 20% on the standard system. Turbo ST beefs up character printing by 31%.

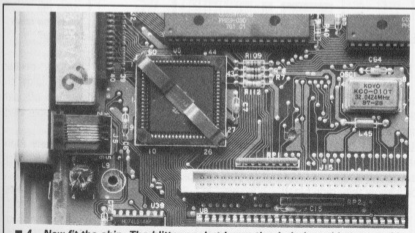
Line drawing is faster by 22% when the blitter is onboard. Turbo ST does nothing to improve performance. Box drawing is increased by 82% with the blitter (for very large boxes, that is). Again Turbo ST does nothing.

Software performance is marginally improved by both blitter and Turbo ST. ST BASIC is perhaps most noticeably improved when Turbo ST is installed – it almost makes ST BASIC useable. Most packages that manipulate text benefit from Turbo ST: Word Writer, GFA BASIC, Final Word, Data Manager. While all software that uses GEM will benefit marginally from the blitter, there is next to nothing that really shows off the true power of this chip – Cyber Studio is one exception.

the blitter, so window operations will be much faster. All software that uses GEM's block graphic calls will reap the blitter's benefits. Games software will not usually, unless the routines access the blitter directly.



■ *3 – Remove the solder blobs with a solder socket. Try not to suck half the circuit board at the same time. Remove the metal bar lying across the blitter socket. Use a blunt instrument.*



■ *4 – Now fit the chip. The blitter socket has a tiny hole bored into one of its edges; the blitter has a similar-sized indentation along one of its sides. This indicates which way the chip fits into the socket. Put the bar back when you've fitted the blitter. And now put the rest of the ST back together. Pray that the blitter functions correctly.*

TURBO ST

£39.95 ST only ■ £39.95 ■ Softrek/HiSoft, The Old School, Greenfield, Bedford, MK45 5DE (0525 718181)

The blitter chip is very good at moving large amounts of data around the screen quickly; but when it comes to shifting character-size blocks, it's hopeless. The reason is that the blitter takes a long time to set up: numerous parameters must be sent to the chip telling it what it has to move and what operation it must perform on the data it moves. This procedure is slow and must be carried out for every single operation.

As the ST has no text mode (characters are displayed on screen in graphics mode), any operation that involves placing characters on screen will use the blitter if it's there. Usually characters are held in an 8x8 matrix – not very large which means the blitter's powers are poorly used.

Turbo ST has been designed to speed up most ST programs that write text to your screen – word processors, spreadsheets, DTP packages, certain features of the Desktop and so on.

The software that does the speeding up is an Accessory, so all you need do is place the program in the root directory of your boot disk. Resetting the computer causes the accessory to load automatically. From the Desk menu you can click on the Turbo ST option which causes a dialog box to appear. Options let you install or remove Turbo ST. That's all there is to it.

Does it work? Yes. But it's unlikely you'll notice the difference – not unless you switch Turbo on and off regularly and watch closely, that is. Most programs that manipulate text will benefit from being turbocharged (see the box for more details). Commercial games won't; neither will graphic-intensive packages.

TURBO ST

for

- Very simple set up procedure
- Faster than the blitter for certain operations
- Works with the majority of GEM-based programs

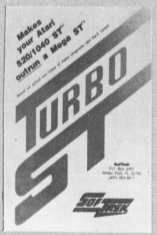
against

- Won't increase printing of GDOS fonts
- Only speeds up text and rectangle fill routines

BUYING THE BLITTER

Not an easy one this as there's a serious shortage of the chips. Atari have a stock, but these are being sent to dealers and customers who have requested the superslice of silicon months ago. It's unlikely that the situation will improve until early next year. Your local dealer might be able to supply you with a chip under the counter... but at what cost? Around £22.

With Megas, Blitters are usually included in the price and your dealer should be able to get and fit one for you. Certainly Silica Shop, the main Atari dealer, offer a free upgrade service for all Megas bought from them.



features 0 1 2 3 4 5

performance 0 1 2 3 4 5

ease of use 0 1 2 3 4 5

manuals 0 1 2 3 4 5

format value 0 1 2 3 4 5

ST PD

Public domain libraries just grow and grow. And the quality gets better and better – Richard Monteiro peruses the best of the latest ST PD utilities.

There's more to PD software than games, demos and digitised nudes. Forget them all and take a look at some of the exciting quality software that is beginning to emerge.

Lots of good software exists; really outstanding programs are harder to come by. Quality, originality and competence usually merits a PD Platinum accolade – titles given these awards really shouldn't be missing from your collection.

PD PLATINUM

FSEL

When you load or save a file from within a commercial program, it is likely you will be presented with a file selector box. This allows you to type in a file name, log in another disk or open a folder. The imaginatively named FSEL customises the standard GEM selector making it much friendlier and more powerful.

FSEL sits in an auto folder and automatically loads at start up. It uses up around 20K of memory which is negligible when used with the majority of software. You won't be aware of the patch until you load or save a file from within a commercial package: ST BASIC, TIMEWORKS, DEVPAC ST, DEGAS ELITE, and so on.

Unfortunately no documentation comes with FSEL, but it doesn't take long to work out what it does.

Along with the standard file selector options, FSEL displays extra file information, like the creation date and size. Files may also be sorted alphabetically, by extension, by date or by size. The directory can also be printed at any time and any drive can be selected as long as it is present.

An icon with a question mark also sits in the customised file selector; clicking on it appears to have no effect. Can anyone help?

FORMAT 11

Available in accessory form, this disk formatting program will stretch your ST's drive capabilities to the limit. Doubtless you're sick of formatting utilities, but this one beats the lot! Even Amiga owners will cringe when they know how much data can be saved on a double-sided disk – 925K in total. Astounding.

The formatter works by squeezing 11 sectors onto each track, and formatting 83 tracks. Yes, your drive needs to be in tip-top condition. That said, we found disks formatted in this manner to be reliable. If next month's issue of Format is late, you'll know they didn't last!

DISKMECH

A superb disk analyser, archiver and editor. Just look what it can do: the sector editor can read and edit any sector regardless of size, track number, or side number; the format editor lets you create any type of sector layout with custom ID fields, any gap lengths, control CRCs, and many other oddities; the analyzer copes with abnormal formats and displays track information, data between sectors and ID fields.

The copier is pretty hot too; suffice to say that it comes with a full range of backup utilities that extends to cover copy-protected disks.

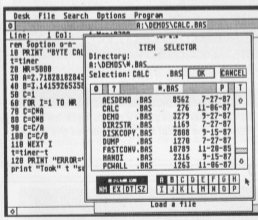
PD PLATINUM

SUPER BOOT 2.0

An all-in-one boot program that does just about everything you could ever want. It allows you to display any picture in TNY format, choose which accessories to load, choose from any number of DESKTOP.INF files (thus allowing you to change resolution, window layout and so on), decide which programs in the AUTO folder to run, have Write Verify on or off, set the date and time, and a whole load more.

Super Boot works on any Atari ST, from any boot drive, and in either colour or monochrome.

A configuration program allows you to tailor Super Boot to your preferences. This alters the main program which resides in an AUTO folder. Options are turned on or off by pointing and clicking – very friendly for free software. Even the documentation is good – too god to be true!



■ *The customised file selector offered by FSEL. It offers immediate drive selection, printout of directories, file sorting and extra drive information. But what does the question mark icon do?*

SUPPLIERS

For the latest ST PD try any of the following: Softville (0742 588429), Floppyshop ST (0224 691824), Page 6 (0785 213928), Star UK (0224 593024). All the PD mentioned this month was supplied by Floppyshop ST – thanks chaps. The disks in their catalogue system to look out for, in case you are interested in ordering, are UTL.09 and UTL.36.

If you run a Software library and would like to be mentioned on this list, or if you have discovered titles worthy of a mention on these pages, please let us know. Write to *PD Update, ST/Amiga Format, 4 Queen Street, Bath, BA1 1EJ.*

OTHER NOTE WORTHY TITLES

Look out for these items of PD software also worth a place in your collection:

PC COMMAND – a command-line interpreter with batch file support. It provides an interactive interface to TOS. Commands are similar to PC-DOS. Provides faster access to TOS facilities than the GEM desktop. Multiple commands can be entered on a single line for better efficiency.

TURBO DOS – speeds up FAT searching (by at least two times), caches all directories ever read and fixes the 40-folder bug.

PRIVATE EYE – an accessory that displays everything there is to know about your ST: drives attached, memory, Caps Lock status, etc.

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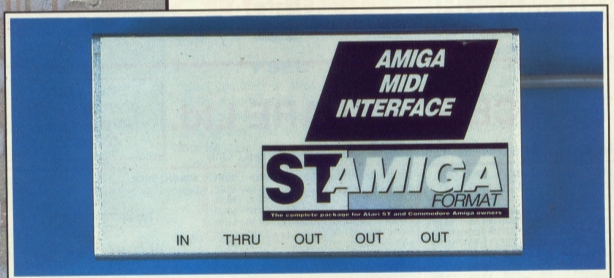
MIDI ON THE AMIGA

Judging from the replies to issue 1's questionnaire, a good number of you want to dabble in hardware projects. Never say we don't deliver. Robert Penfold explains how to build a price-busting MIDI interface for your Amiga and gives a few useful applications.

The range of MIDI software for the Amiga is not yet what could really be called vast, but there is a steady flow of new MIDI titles, and the Amiga has good potential in this area. Unlike the Atari ST, the Amiga has no built-in MIDI ports. The standard form of commercially available add-on MIDI interface for the Amiga is a simple adaptor for the serial port.

A MIDI interface for the Amiga does not need to be particularly complex, and it makes an ideal project for Amiga do-it-yourself addicts. The unit featured here plugs into the serial port of the A500, A1000, or A2000 and provides MIDI 'IN', 'THRU', and three 'OUT' ports.



■ *The completed unit in all its glory*

Serial crops

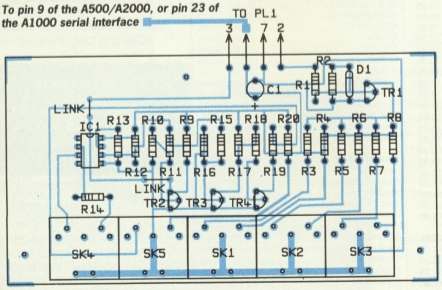
Essentially, a MIDI interface is no more than a high-speed RS232 serial interface. However, there are differences between MIDI and standard RS232C interfaces, and these must be taken care of by software and the computer's hardware.

The standard MIDI word format is one start bit, eight data bits, one stop bit, and no parity. This is probably the most common RS232C word format, and it is one that any RS232C interface should be able to handle without any difficulty. The original MIDI specification had the baud rate at 19200 baud, which is the highest standard rate for RS232C interfaces. This was deemed too slow, and was raised to 31250 baud when MIDI was finally launched. This high and non-standard baud rate is the main obstacle when trying to use an ordinary serial port for MIDI purposes.

Construction details

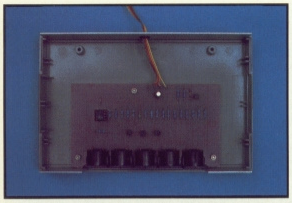
Construction of the unit is made as easy as possible by having everything (including the five sockets) mounted on the printed circuit board. Details of the printed circuit and component positions are provided in Fig. 1.

There are a few minor points to note when building the board, one of which is to make sure that IC1 is fitted round the right way. The U-shaped indentation on the body is not always present, but if not there should be a dot at the end of the component and

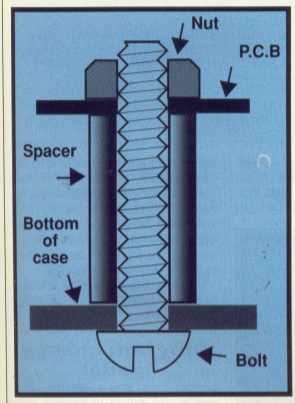


■ ***Figure 1 – The component layout. In blue are the conductive copper tracks on the board. What you have to do is insert each component into its correct holes from the uncoppered side of the board, so that the wires stick out of the coppered side. Then solder the leads to the tracks. Refer to the parts list to make sure you put the right ones in the right places.***

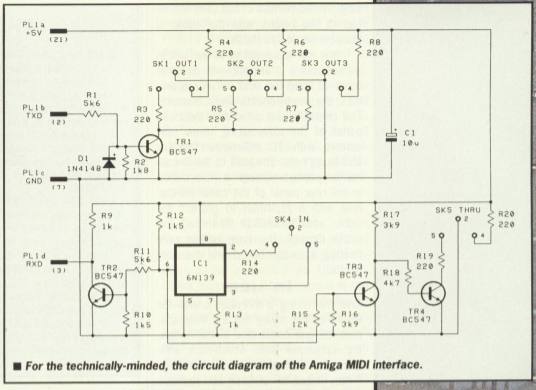
This isn't printed at full size, so you can't etch your own board. A kit of parts is available – see later in the article.



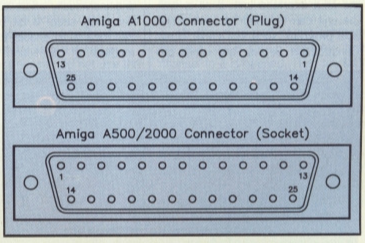
■ *A top view of the completed board.*



■ *How to mount the board in the box using spacers. Drill out the three mounting holes marked on the board if you need to – don't try a hammer and nail or you'll split it!*



■ *For the technically-minded, the circuit diagram of the Amiga MIDI interface.*



■ *Figure 2 – Connections to the serial interface 25-pin D connectors. These are viewed from the back, the side you see when soldering. The 12 volt power line is pin 9 on the A500/A2000, pin 23 on the A1000. The other pins used – 2, 3, and 7 – don't change.*

offset to the left (it indicates which pin is pin 1 of the device). You should solder the IC socket onto the board first of all (it doesn't matter which way round that goes), then slot in the chip itself the right way round.

You must also be careful to fit D1 and C1 round the right way. A '+' (and/or a '-' sign) on the body of C1 will show which lead is which, match it with the + on the board layout diagram. The four transistors have their leadout wires arranged so that they drop nicely into place on the board, but make sure there are no crossed-over wires. The resistors can be fitted either way round, but be careful not to get any of them swopped over. Two link-wires are needed, and these can be made from pieces of wire trimmed from resistor leadouts and bent to shape.

If you are new to electronic project construction, it's essential to practice soldering a few wires together before starting on the circuit board. Either that or buy two sets of components – one to practice with and one to build up properly!

You will need a soldering iron with a rating of about 15 to 25 Watts fitted with a bit of around 2 millimetres in diameter. The best solder for this type of work is a '22 s.w.g. 60% tin/40% lead multi-cored flux' type. Use plenty of solder when mounting the DIN sockets on the circuit board as they need to be well and truly fixed to it. Make sure all the components are fully pushed down onto the board before soldering them. It helps to splay the leadout wires of resitors and transistors slightly.

Good joints

Excess length on the component leadout wires should be trimmed about 3 millimetres proud of the board before they are soldered in place. When making the soldered joints place the iron on each joint first and then feed in the solder. A good joint will have a sort of mountain shape. A globular appearance usually indicates a connection of dubious quality. Where the connections are crowded together be careful to avoid bridging adjacent pads with too much solder. Carefully check the board for any accidental short circuits of this type and remove any that are found.

The board is connected to the Amiga via a lead about 1 metre long terminated in a 25 way D connector. A plug is needed for the A1000, but the serial port on the A500 and A2000 was changed to give IBM compatibility. A socket is therefore needed for these versions of the Amiga. The MIDI unit draws its power from the 12 volt pin of the RS232 port - this is pin 9 for the A500/A2000 but pin 23 for the A1000. Pins 2, 3 and 7 are the same for all Amigas, as shown in the wiring diagram for the different types of connector in Fig. 2.

Any 4-way cable should be suitable for the connecting lead. The multi-coloured "rainbow" type is best as this largely avoids the risk of misidentifying leads and getting crossed wires. Melt some solder onto the bared ends of the leads, and the appropriate four tags of the connector, before soldering the lead to the plug. There should then be no difficulty in making reliable joints. Fit the connector with a cover assembly. At the board end the lead can be soldered direct to the board, but it is easier if

DOESN'T WORK?

It isn't entirely beyond the realms of possibility that your Amiga MIDI interface won't work first time, particularly if you aren't an experienced solderer-cum wielder.

Magenta Electronics, who are supplying the kit of parts, are also offering a GET YOU GOING SERVICE. If you really can't make your unit work, send it back with a £4 cheque to cover service and post to: *MIDI Unit Repairs, Magenta Electronics, 135 Hunter Street, Burton-on-Trent, Staffs DE14 2ST.*

Make sure it is adequately padded from the post's infelicities, and please allow a couple of weeks for return.

single-sided printed circuit pins are fitted to the board, and the cable is then connected to these.

It is not essential to fit the unit in a case, but it is advisable to do so in order to keep the dust off and to protect the components from knocks. The circuit board is fixed to the base panel of the case using three 6BA screws with 10 millimetre spacers and fixing nuts. The lead to the D connector passes through a hole drilled in the rear panel of the case. Fit this hole with a grommet to protect the cable and remember to thread the cable through the hole before connecting it to the board and the connector.

In use

Give the wiring a thorough check for errors before trying out the interface. With the unit connected to the Amiga, the computer and Workbench software should boot-up and run normally. If not, switch off at once and recheck the MIDI interface unit. If all is well, the unit can be tried out with a suitable program, such as *Deluxe Music Construction Set*, or any other program which uses the serial port method of MIDI interfacing. The interface connects to the other MIDI equipment via standard (5 way DIN) MIDI Leads.

Although there are three outputs, they all transmit the same data. You do not have access to three separate and individually addressable outputs. This may seem a bit pointless, but this idea is to enable the MIDI 'star' method of connection to be used without having to buy a special THRU box (unless you want to drive more than three instruments from the unit that is).

If you like to write your own software it is not too difficult to access the MIDI interface, although it does not seem to be entirely straightforward from Amiga BASIC. Writing your own top flight sequencer or music notation programs is probably where do-it-yourself programmers can use their machine-code talents to the best effect.

When writing programs in a language that provides support for the serial interface it is probably better to take this route rather than directly controlling the serial port hardware. One point that you must bear in mind is that MIDI does not use handshaking, and so data may well be lost if the computer tries to halt the flow of input data by setting a handshake line to the hold-off state. Any processing of MIDI data must be done at high speed anyway, since the timing of data is normally important, and letting large amounts of data build up in a buffer will not give acceptable results. Although the MIDI baud rate of 31250 can be set using Workbench's preferences, note that this does not necessarily set the required baud rate when running a programming language.

Here follow three simple examples using AmigaBASIC for controlling MIDI instruments.

Program change pedal

Listing 1 is for a program that enables the Amiga to function as a program change pedal. The word 'program' is being used here in its MIDI sense of a set of sound data for a synthesiser, or a set of parameters for any MIDI controllable device. A program change pedal permits the sounds of the instruments in a system to be altered using the 'look no hands' approach. Although this is an invaluable feature for live performances, surprisingly few instruments incorporate it.

In the first part of the program the user enters the MIDI channel number (1 to 16) on which the program change messages must be transmitted. (Remember you must click the mouse on the input window before you can enter anything into an INPUT instruction.) Each program change message consists of two bytes, and the first of these is the one which carries the program change code (most significant nybble) and the channel number (least significant nybble). The program change code is 1100 binary, which is 192 in decimal. The channel number must be added to this to give the total value of the first byte. MIDI channels are conventionally numbered from 1 to 16, but the values used in MIDI messages are actually from 0 to 15. Adding 191 to the channel number entered by the user therefore

THE MIDI BAUD RATE

The MIDI unit plugs into the Amiga's serial interface, so how does the system know to use the higher-than-normal Baud rate required?

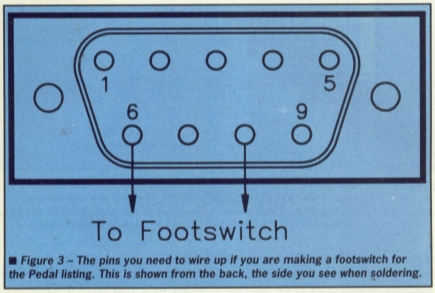
The Amiga controls its Baud rate by having a divide-by-'N' circuit between a clock generator and the device which provides the serial encoding/decoding (which is done by the the Amiga's 'Paula' custom chip). N is a number written to a hardware register, enabling any Baud rate within reason to be obtained with a fair degree of accuracy.

The Amiga's divide-by-N register is called 'SERPER', and is at address $DFF032. Not all computer languages, including AmigaBASIC, will accept six-digit hexadecimal numbers, so you need to use the decimal equivalent, 14676018.

Bits 0 to 14 of SERPER supply the number for the divide-by-N operation. To be precise, the divisor is one more than the number written to this register. Bit 15 of SERPER controls the byte length, which is either 8 or 9 bits. It would normally be 0, for eight bit operation.

With the aid of a calculator it is not too difficult to work out the correct value to write to SERPER. Each clock cycle lasts 0.2794μs, and the duration of each MIDI bit is 32μs. Dividing 32 by 0.2794 and deducting one gives the correct divisor, which is 113.53. Values of 113 or 114 give a Baud rate accurate to 0.5%, which is perfectly acceptable.

In the AmigaBASIC listings given elsewhere in the article, you will see the line `POKEW14676018&,114`. You should now be able to deduce why this sets the serial interface up for MIDI Baud rate.



■ ***Figure 3 – The pins you need to wire up if you are making a footswitch for the Pedal listing. This is shown from the back, the side you see when soldering.***

LISTING 1 – PROGRAM CHANGE

```
REM MIDI 'Program Change Pedal' Program
INPUT "Enter channel number (1 to 16) ", channel
change=channel+191
x=0
prog=0
OPEN "com1:300,n,8,1" AS #1
POKEW 14676018&,114
WHILE x=0
IF STRIG(2)=-1 THEN GOSUB midiout
WEND
midiout:
prog=prog+1
IF prog>63 THEN prog=0
PRINT# 1,CHR$(change);
PRINT# 1,CHR$(prog);
RETURN
```

LISTING 2 – MIDI CONTROLLER EDITOR

```
REM MIDI Controller Program
OPEN "coml:300,n,8,1" AS #1
POKEW 146760188,113
INPUT "Enter channel number ",chan
INPUT "Enter controller number ",conumb
header=chan+175
x=0
WHILE x=0
q=MOUSE(0)
z%=MOUSE(6)/1.92
PRINT PTAB(100);z%
PRINT# 1,CHR$(header);
PRINT# 1,CHR$(conumb);
PRINT# 1,CHR$(z%);
a$=INKEY$
IF a$=" " THEN GOSUB contnumber
WEND
contnumber:
PRINT " "
INPUT "Enter controller number ",conumb
RETURN
```

gives the correct value for the first byte in each message. The second byte in the message is simply the new program number, which is from 0 to 127. This is assumed to start at a value of 0, and the program increments it by one each time the pedal is operated.

The OPEN statement opens a channel to the serial port and sets it up with the right parameter. At least, it sets it up correctly apart from the baud rate, which is set to the right figure by the POKEW at the next line. The main body of the program is a three line WHILE...WEND loop. This checks the fire-button of joystick port 2, and branches the program MIDI-OUT subroutine when this button is operated. A joystick connected to port 2 is fine for testing purposes, but to use the system in earnest a foot pedal must be connected to port 2 via a 9 pin D socket. Connection details for the socket are shown in Fig. 3.

Some instruments do not use the MIDI program change numbers when selecting programs by way of the front panel controls. On a Casio CZ1 for example, programs are selected by two rows of push-buttons labelled A to H and 1 to 8. The instrument's manual should make it clear how these program identifiers relate to the true MIDI program number. If the maximum acceptable program number is reached, the program cycles back to zero again, and continues in this manner indefinitely.

The program could easily be extended and customised to meet individual requirements. Extra pairs of PRINT# instructions plus an extended INPUT instruction could be used to permit the program change messages to be sent on more than one channel. Rather than having to adjust the instruments to set programs 0, 1, 2, 3, etc. to the required sounds, it should not be too difficult to produce a version of the program that enables the user to specify a sequence of program numbers.

In control

Most MIDI instruments permit at least some of their sound generator parameters to be controlled via MIDI controller messages. The program in the second listing enables a controller to be selected from the keyboard and then adjusted by moving the mouse backwards and forwards. The screen displays the current controller value. This is generally faster and easier than controlling instruments via their rows of push button switches.

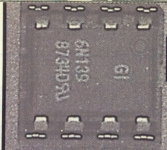
In the initial part of the program the MIDI port is set up and the output channel to it is opened. Then the MIDI channel number and initial controller number are entered by the user. The MIDI control change message has 1011 in binary as the most significant four bits of the header byte (176 in decimal). Adding 175 to the channel number therefore gives the value of the entire header byte, which is stored in the variable HEADER. The main body of the program repeatedly outputs three byte MIDI controller messages. These consist of the header byte followed by the controller number, and then the value to be assigned to the controller. This value is obtained by reading the mouse using the MOUSE(6) function (which must be preceded by a dummy MOUSE(0) instruction). The value returned from the mouse is in the range 0 to 244, but it is converted to an integer in the desired ranger of 0-127 by some simple division, and rounded by assigning it to the integer variable Z%.

The final part of loop is used to

BAUD AND SIGNAL LEVELS

From the hardware point of view the main difference between MIDI and an ordinary RS232C interface is that MIDI uses a current loop system, whereas RS232C interfaces use different voltages to represent the two logic levels. The RS232C voltages are not normal 0 and 5 volt logic levels, but nominal potentials of plus and minus 12 volts. MIDI has a nominal output current of 5 milliamps which is switched on or off to represent the two logic levels. This is rather like switching a light bulb on and off, but it is actually a light emitting diode that is being controlled. This forms part of a device called an optoisolator which is standard issue at every MIDI output. The light output of the l.e.d is directed at a photo-cell, and this simple arrangement couples the signal through to the controlled equipment without having any direct electrical connection to it. This reduces the risk of problems with the "hum" loops that tend to plague electronic music systems, as well as eliminating the risk of electrical noise from the Amiga (or other micro-controller) being coupled into the audio circuits of the controlled instruments.

These differences in the input and output signals are all handled by the add-on interface.



MIDI PROGRAMS ON DISK

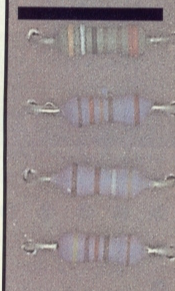
To get you going with MIDI we've included all the listings from these pages and two other superb utilities on this month's cover disk.

DX VOICE FILER – allows you to store sound voice data from any of the popular Yamaha DX series synthesizers.

MIDI UTILITY – allows you to record a MIDI sequence onto disk and play it back, and also acts as a voice filer for the Casio CZ101 synthesizer.

LISTINGS – the listings are in a drawer called MIDI LISTINGS on the disk. You need to load AmigaBASIC to be able to run them.

→ See the Disk Extra section on page 73 for more details.



■ *Thanks to the Bath Computer Shack for the loan of the Casio CZ101 keyboard used in the photographs.*

If you are looking for a entry-level MIDI synth, the Casio CZ101 or the Casio CZ230S are both recommended buys. They will cost around £250.

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monitor the keyboard, and it branches the program to the CONTNUMBER subroutine if the spacebar is pressed. This enables the controller number to be changed as and when desired.

It is perhaps worth pointing out that the MIDI continuous controllers have numbers from 0 to 63, but that these are used in pairs. For instance, controller 0 and controller 32 are paired, as are controllers 1 and 33, 2 and 34, etc. The lower numbered controller provides the seven most significant bits of the fourteen bit value, with the higher numbered one contributing the least significant bits. It is quite possible to roughly adjust a controller and then switch to its better half so that it can be fine tuned. In practice this is not usually necessary as few instruments use the full resolution, and the controllers from 32 to 63 are usually left unused.

Control numbers from 64 to 95 are switch types, and are either on (127) or off (0). For these controllers no other values are recognised by MIDI devices, but invalid numbers will not cause a malfunction. It is therefore quite in order to operate them by manipulating the mouse for a value of 0 or 127. Controller numbers above 95 are either unassigned, or used for things such as MIDI mode changing.

Due Process

A useful application for a computer is a MIDI processor. This is where the MIDI signal is taken in, doctored in some way, and then either fed back to the source or sent on to another device. A harmoniser is a good example of MIDI processing. This is where the MIDI signal from an instrument is altered so note values are all raised or lowered by a certain amount. If this signal is fed back to the IN socket of the source instrument, each note played on its keyboard produces a simple two-part harmony.

This function is provided by the program of listing 3. Although this is an Amiga BASIC program, it loads machine code which does all the processing. Amiga BASIC is really too slow for this type of thing, and there are difficulties in reading the serial port on a byte by byte basis anyway. Attempts to overload the machine code routine proved fruitless.

When asked to enter the note offset it is alright to use a negative number if the additional notes must be lower in pitch than the originals. A value of 5 or 12 will give a pleasant effect. Don't worry about the mouse 'dying' when the machine code program is running – it will come back to life when you exit the program. When using this program, remember that the MIDI output of the instrument must connect to the input of the MIDI interface, and the output of the interface must be connected back to the MIDI input of the instrument.

LISTING 3 – MIDI HARMONISER

```
REM MIDI Harmoniser Program
POKEW 146760188,114
INPUT "Enter offset in semitones ",offset
offset=offset+256
POKEW 146761228,8228
ba=2000008
FOR loop=1 TO 57
READ v(I)
POKEW ba,v(I)
ba=ba+2
NEXT loop
ba=2000008
POKEW 2000988,offset
PRINT "Press left mouse button and play
    note to exit"
CALL ba
POKEW 146761228, 40996&
DATA &H267C,&H00BF,&HE001
DATA &H343C,&H0800,&H363C,&H0080,&H227C
DATA &H00DF,&HF030,&H247C,&H00DF,&HF09C
DATA &H207C,&H00DF,&HF018,&H3010,&H0800
DATA &H000E,&H6700,&HFFF8,&H3482,&H3200
DATA &H0241,&H00E0,&HB641,&H6700,&H0010
DATA &H0240,&H00FF,&H0640,&H0100,&H3280
DATA &H6000,&HFFDC,&H0240,&H00FF,&H0640
DATA &H0100,&H3280,&H3010,&H0800,&H000E
DATA &H6700,&HFFF8,&H3482,&H0240,&H00FF
DATA &H0640,&H0105,&H3280,&H1413,&H0802
DATA &H0006,&H6600,&HFFB2,&H4E75
```

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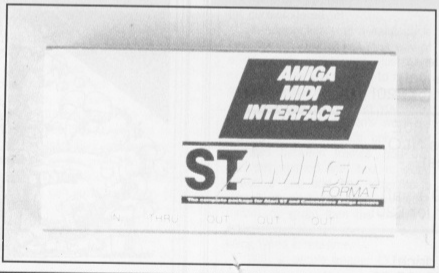
IMPORTANT: unless you specifically ask for an A1000 version you will get plugs suitable for the A500/A2000.

Please allow 21 days for delivery.

If you do want to shop around for yourself, one source of electronic components is Maplin Electronics in Essex. You'll find their catalogue for sale in most branches of WH Smiths.



PARTS LIST

RESISTORS (all 0.25 Watt, 5% or better)		
R1, R11	***5k6 (2 off)***	***green, blue, red, gold***
R2	***1k8***	***brown, grey, red, gold***
R14	***220Ω***	***red, red, brown, gold***
R3 to R9, R13, R19, R20	***1k (10 off)***	***brown, black, red, gold***
R10, R12	***1k5 (2 off)***	***brown, red, orange, gold***
R15	***12k***	***brown, red, orange, gold***
R16, R17	***3k9 (2 off)***	***orange, white, red, gold***
R18	***4k7***	***yellow, violet, red, gold***

The gold band at the end of all the resistor colour codes means 5% tolerance. A red band means 2%, and brown 1% – either of these is quite satisfactory to use.

SEMICONDUCTORS		
IC1	***6N139***	***Opto-isolator (Integrated circuit)***
TR1, TR2, TR3, TR4	***BC547 (4 off)***	***Transistors***
D1	***1N4148***	***Diode***

CAPACITOR	
C1	***10uF 25V radial electrolytic***
MISCELLANEOUS	
SK1 to SK5	***5 way 180° DIN sockets, printed circuit mounting***
PL1	***25-way D connector (see test; varies with model of Amiga).***
	Printed circuit board
	Case about 180x120x40mm
	8-pin d.i.l. integrated circuit holder
	6BA 12.5mm bolts, nuts and 6.5mm spacers (3 of each)
	1mm diameter printed circuit pins
	1 metre of 4-way cable
	1 suitable grommet
	solder

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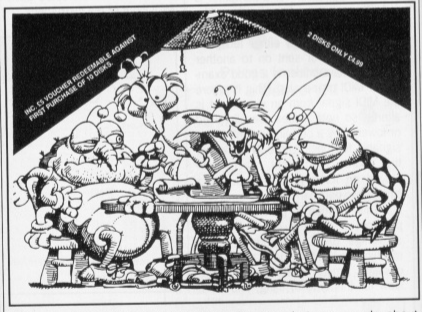

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REVIEW

LIGHTS! CAMERA! ACTION!

Wipes, fades, cuts, flips... they're not Olympic high diving styles, they're features offered by Aegis' new 'desktop presentation' software. Ben Taylor admires the show.

Lights! Camera! Action!
£57.50 ■ Amiga only, requires 1MB ■ Aegis/HB Marketing, Brooklyn House, 22 The Green, West Drayton, Middx UB7 7PQ (0895 444433)

Commodore have long proclaimed, slightly pretentiously some might say, that Desktop Publishing is only a small part of the greater world of 'Desktop Presentation'. The theme is that the Amiga is the ultimate tool for converting your imagination into a combined audio-visual extravaganza. Whether you're a graphics designer looking to make up a stunning demo of your work, or a businessman making a sales pitch, *Lights! Camera! Action!* aims to give you that ability.

L!C!A! allows you to define a 'script' of still pictures, sounds and animation clips. A sequence might be (1) start some background sitar music; (2) display the logo of the Taj Mahal restaurant; (3) fade into a picture of a steaming curry; (4) cut to animation of a waiter approaching with the bill; (5) fade with a diamond pattern effect to a picture of the washing up by the sink.

In short, L!C!A! is a tool for creating slide shows from still pictures and music. It isn't a full animation package in the sense of defining two pictures generating all the intermediate frames automatically.

Still crazy

L!C!A! takes still images from any standard Amiga picture file: low resolution, high resolution, HAM mode, the little-known 'Extra Halfbrite' mode, and any interlaced version of these.

The standard 320 by 256 (or 640 by 256 in medium/high res) pixel display doesn't normally fill the entire Amiga screen, but because the end result is supposed to be a TV-style presentation, possibly for recording to videotape, L!C!A! uses a technique called 'Overscan' to allow you to display images up to 768 by 600 pixels such that they bleed smoothly off the edge of the screen as a normal TV picture does. (How you create these oversized pictures is your problem – most paint packages will only save in the standard size. However, Photon Paint, the DigiView 3.0 digitiser and Deluxe Paint II can all work at the larger size.) Different sizes of picture are handled well; you can mix overscan and ordinary size images, PAL (256/512 line) and NTSC (200/400 line) screens all in the same script, and they will be properly centred in the screen. You can even intercut with video pictures if you have Genlock hardware.

Stills can be displayed for any time that you choose – the fun of it all comes in how it gets to the screen. You can fade it in, 'wipe' it over an existing picture in any of 9 directions. You can gradually convert one picture into another with a pixel 'dissolve', introduce it via a pattern of diamonds or triangles which gradually merge together, or create a window within one picture and scroll a second one up it. When one picture flips to another the transition is almost instantaneous, but the wipe effects are a bit jaggy as they slide across the screen.

You can split the display into two 'multiple viewport' screens so that two pictures are scrolled together, each with their own colour palette and/or colour cycling effects active.

Sounds good

The range of sounds that L!C!A! can play are geared mainly toward soundtracks created with the Aegis Sonix package, though any 'SMUS'-format picture file can be included. Unfortunately, this format limits you to composed notes played through the sound chips, it cannot deal with digitised sounds. There is no direct way of including, for example, an explosion noise at suitable points.

The music you can include in your presentations is therefore determined by what music package you own, Sonix being preferred. You can play the tune either as a once-off, or repeating in the background until the video script ends.

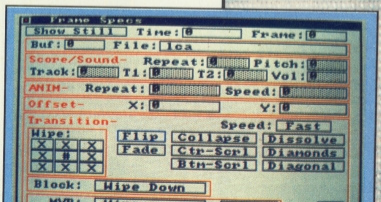
Although you can't alter the instruments with which a saved score is played, you can change its pitch, volume and timing.

Animations

Provided with L!C!A! is a utility called GrabAnim, a 'grabber' tool to allow you to put an animation together in a format that can be played smoothly. You really need a joystick to use it: with GrabAnim running in the background, you press the Fire button to grab a screen, which is then added to the current stored set.

In conjunction with a paint package, this can give you a slick way of doing simple animations – just grab each frame as you move it to its new position. GrabAnim stores the data in a compressed format, so you don't take up a whole screen's worth of disk space if there are only minor changes between frames. You can use this method with text to good effect: if you add one letter to a screen on text for each animation frame you grab, then the animation makes the message appear as if it is being typed in real-time.

With a simple image, L!C!A! will



■ *The main script editing screen for Lights! Camera! Action! You can control the 'wipes' from here – the special effects for how the pictures are faded in and out.*

GENLOCKS

A Genlock, constantly referred to in graphics articles, is a piece of hardware which allows your computer to mix its graphics with a TV or video recorder's pictures, creating the kind of effects you see on the Chart Show or Network 7. Genlocks cost around £200 for the Amiga, and there are none we know of for the ST.

GETTING GOING

We used an A2000 to review Lights! Camera! Action! with, and there's one problem you will need to know about. All the demo files assume you are using an A500/A1000 whose disk drives are DF0 and DF1. The A2000's external drive is called DF2, and the demos won't work. You need to edit the STARTUP-SEQUENCE file to include the line ASSIGN DF0: DF1:

display around half a dozen frames per second from GrabAnimmed files.

The verdict

The major problem with L!C!A! is text handling. If you want to make up text screens to introduce a picture, or even add captions to pictures, there is just no way you can do it. You have to use an art package to save the text screen as a picture, or edit the captions into the images, by hand. Obviously this takes up more disk space than text alone really deserves, and is a major omission in an otherwise extremely well-designed package. The other annoyance, as has been pointed out, is not being able to include digitised sounds in a demo.

Overall, L!C!A! is a package that is superbly simply to use and can create impressive rolling demos of any graphic screens. It just lacks the flexibility, especially in its poor text handling, to be a vital business tool, and it doesn't really try to be a top-flight animation program. Electronic Arts' *Deluxe Video* (see issue 2) is a more sophisticated tool in these areas, and can run on an unexpanded A500, but is much harder to use.

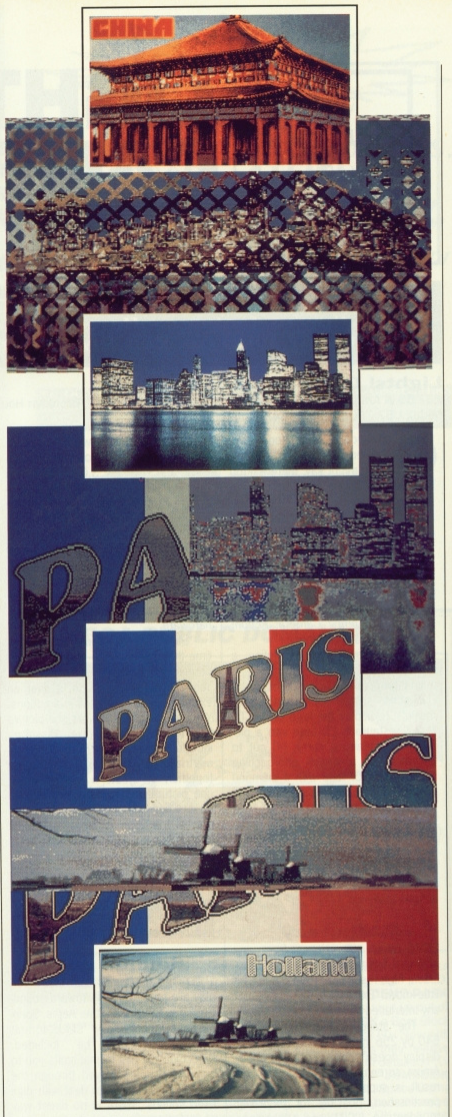
However, any would-be artist will find it a matter of minutes to knock up an impressive demo, and simplicity is something to be highly valued.

GO FASTER STRIPES

When you start to put together complex presentations, particularly if you want to flip from one still to the next quite rapidly, you are going to start being frustrated by the fact that the Amiga's disk drives are slower than the speeding bullet. To load a picture from disk can take three or four seconds, which is therefore effectively the shortest possible display time.

To help minimise this, L!C!A! has the idea of 'buffers'. You can have up to 99 buffers, each holding a picture, animation or music score in memory. While one picture is being displayed, you load another into a buffer so that when the time comes to display it, the results are pretty much instantaneous. The drawback is, of course, that you need lots of memory to hold one picture in reserve while another is being displayed. Even with 1MB you'll be pushed to buffer many pictures up.

Once your demo is all finished, there is a stand-alone 'player' program so that you can distribute the show to people without L!C!A!



■ *If it's Tuesday it must be Hyderabad... a World tour courtesy of Lights! Camera! Action!. Starting in China, a diamond fade cuts to Manhattan's towers. A horizontal wipe takes you into Gay Paree – this doesn't use the multiple viewport features, so the palette of the New York picture has been messed up by the next picture's palette. The next fade, into Holland, does use multiple viewports so the windmill's palette is correct as it wipes from the centre over the old picture.*

features 0 1 2 3 4 5

performance 0 1 2 3 4 5

ease of use 0 1 2 3 4 5

manuals 0 1 2 3 4 5

format value 0 1 2 3 4 5

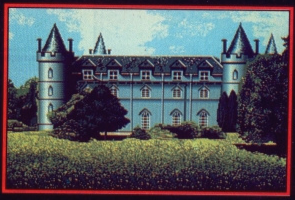
for

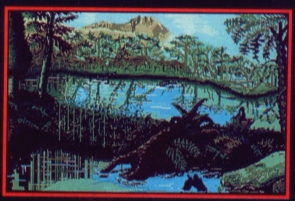
- Simple to use
- Displays TV-size 'overscan' pictures
- Wide range of fade/wipe etc effects
- Animation creator utility included
- Pics with 2 different colour palettes displayed

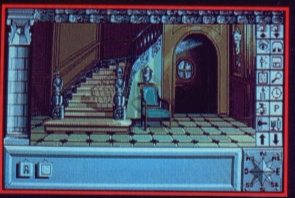
against

- No way to add text within L!C!A!
- No way to include digitised sounds
- Needs 1 Megabyte of RAM

CHRONO QUEST







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You will be presented with many objectives; ultimately you will have to travel through time to collect the fragments of magnetic card to drive the Time Machine into the future. There you will have to . . . Meanwhile, the immediate objective is to find the time machine . . . Sorry, a more immediate objective is to find the room with the time machine in it . . . But its dark . . . Very sorry, an even more immediate objective is to be able to see where you are going . . . 3 hours and 250 minutes and even more immediate objectives later, you are standing in the hallway thinking . . . hellpppp!!!!!!!

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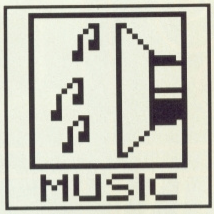
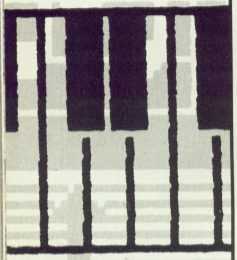


APRES MIDI



So you've got a headful of great tunes and a MIDI system – what happens next? Chris Jenkins explains a few tips of the trade for recording your inspiration, and how to make money from your compositions.

Over the last few issues we've looked in detail at the marvellous things you can achieve with a computer-based music system, using MIDI and electronic instruments. We've explained the theories behind the software and hardware, and shown you how to set up a studio system.

So there you are, sitting in front of your computer and your synthesisers, itching to make a start. What on earth do you do next? As you go deeper into the practice of recording and music, you'll have to keep remembering that this is a computer magazine! Just bear in mind that your ST or Amiga can help you along with almost every aspect of creating music, from creating the original sounds to typing the labels for the cassettes.

Master tapes

If you create a wonderful picture on your computer, it remains fairly pointless unless you incorporate it into a game or a demo of some sort. In the same way, a piece of computerised music is pretty useless until you turn it into a form where it can be enjoyed by other people; usually, an audio cassette, vinyl record or compact disk. Incidentally, this is also a popular way to make money out of the whole business!

You can always book time in a professional studio to make your recordings, but with plunging equipment costs it's now possible to build up a pretty good recording system in your own home.

Good quality recording equipment needn't cost thousands of pounds, although the 24- and 48-track recorders used in large studios will remain outside the budgets of most of us. 16-tracks such as the Fostex B16, though, are becoming pretty affordable, and remember that the classic Beatles album *Sgt Pepper* was recorded on just two 4-tracks! If you simply want to tape what you play live, any good-quality hi-fi cassette deck (preferably using metal formula tapes and Dolby noise reduction) will do the job. However, if you want to record complex pieces, you'll need to multi-track.

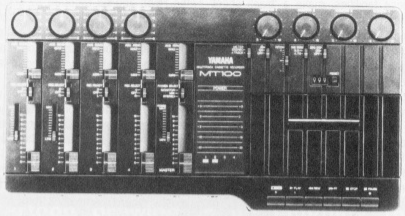
Multi-tracking

Multi-track tape machines allow you to make several synchronised recordings on one tape, listening each time to the previous tracks so that you can build up a complete piece working on your own. As we've remarked in the past, it's often best to buy second-hand, if you can find well-serviced equipment. Multi-track recorders come in many forms. Early models, such as the TEAC 3340/3440, used quarter-inch open-reel tape, and were intended to play 'quadrophonic' music – a fad which never caught on. Instead, musicians started to use them to multi- track, and you can still pick up these excellent 4-track machines at around £300.

■ ***Sergeant Pepper's Lonely Hearts Club Band was recorded on a 4-track mixer – state of the art in 1967! Equipment of the same spec is relatively cheap nowadays, so there's no reason you can't make your own concept albums!***

You'll probably also need an audio mixer, which will allow you to connect all your instruments into the recorder, then combine the results onto a stereo master tape. Mixers can be shockingly expensive, though there are cheap models from Seck, Icon and Boss. Look out too for Tandy mixers which are designed for use in discos, but which can be adapted for recording uses. A popular alternative is the Portastudio-type combined

■ ***Yamaha's idea of a simple little 8-track home studio, as featured in the 1988 PC show. Does your bedroom look like this?***



■ *Yamaha MT100 4-track cassette mixer/recorder, at around £250. this is a good entry level combination console for the home enthusiast.*

mixer/4-track recorder. Tascam introduced the concept, and prices now start at around £215, including the Fostex X15, Tascam Porta-05 and Vesta MR10. Most of these units feature four to six input channels, so if you want you can plug in an entire band. Each input channel has tone controls for bass, treble, and sometimes mid-range.

Some portastudios also feature effects sends. These allow you to wire in a digital reverb or delay unit to 'sweeten' the instrument sounds. Predictably, there are now 8-track cassette portastudios on the market, produced by Toa and Tascam. They both cost around £1200, which sounds like a lot, but is probably the cheapest way to get into 8-track recording. For comparison, a half-inch tape 8-track recorder such as the Tascam 38 would cost you around £1500, and a suitable mixer around £450.

Your computer can help you at the mixing stage, too. Systems such as MegaMix and Twister can allow your ST (and soon the Amiga) to memorise and repeat mixer settings for each channel, allowing you to get a perfect mix every time. These systems, though, only work with pretty sophisticated mixers incorporating 'insert point' features.

Synchronisation

Another major problem when computers meet tape recorders is in track synchronisation. If you have only one synth, but want to record a piece of music with several distinct sequences, how do you synchronise them on subsequent 'takes'? Counting yourself in and hitting the PLAY button at the right time rarely works!

The solution lies in boxes such as the Korg KMS-30 tape-to-MIDI synchroniser. This £129 unit converts

SYNC OR SWIM

Beware! Some software sequencers – such as Microdeal's SuperConductor and Kuma's K-Minstrel – can't read external MIDI clock signals, so you can't use the synchronisation method described in the main text with them. Always investigate thoroughly before buying software.

COMPOSITION TECHNIQUE

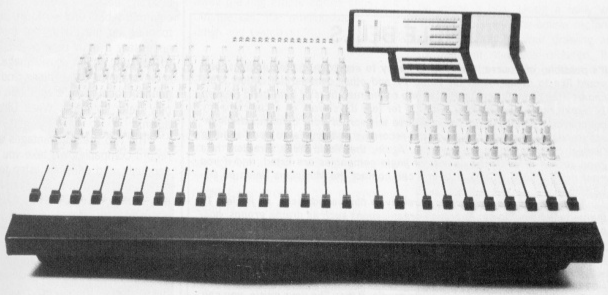
Without going into too much superfluous detail about compositional theory, let's assume that you have your own ideas about the style and character of your music. Normally, recordings are built up from the bottom; drums first, then bass, then chords, melodies, and finally the vocal (if any) and accompaniments. Ideally, you should record with no more effects than are needed to get the sounds on tape with good level and tone control. The effects should be added in the final mix.

In practice, unless you have stacks of equipment, you will have to add some effects as you record; maybe a bit of reverb on the drums, digital or tape delay on your solos, a touch of both on the vocal. Remember that many effects units, such as the Alesis MIDIverb, can be controlled by your sequencer, changing effect type as and when needed in the piece. By mixing and remixing the multi-track (or editing and re-editing your raw sequences) you can change the entire sound of your music. Study the sounds and techniques used on chart and other records, then add your own ideas.

PING-PONG RECORDING

You can build up complex recordings on a small multi-track by 'ping-ponging'. Start by recording on tracks one, two, and three. Re-record these onto track four, and your first three tracks are free again. Record on tracks one and two, and re-record those to track three; then fill up track two, then track one. If you also add new bits of music live on each 'take', you can end up with at least ten tracks on your 4-track machine.

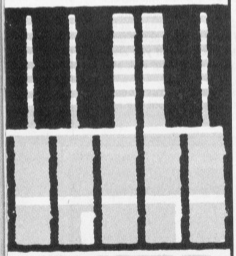
You can apply the same sort of principle to 'track bouncing' from one simple stereo cassette deck to another, but the recording quality soon becomes unacceptable.



■ *Allen & Heath's 16-8-2 mixer, ideal for the 8-track studio.*

BLOW YOUR MIND

Whichever recording system you end up with, you'll need loads of accessories such as leads, plug blocks, tapes, headphones, microphones, stands, and of course an amplifier and speakers to hear what you're doing. A decent hi-fi amplifier and speakers will do to start off with, but you can blow up your speakers if you push the bass too high, so think of investing in decent speakers such as Yamaha NS-20 monitors.



MIDI clock pulses into an audio signal, and vice-versa. As your first track of music is recorded, the KMS-30 reads clock pulses from your software sequencer, and puts out a series of high-speed beeps which you record on a spare track. If the tempo of the sequence changes, the beeps will speed up or slow down to match. On subsequent takes, the KMS-30 reads the audio pulses from your synchronisation track, and transforms them into MIDI clock pulses which your sequencer can respond to.

A fringe benefit is that the KMS-30 can also generate a '24/48 pulse-per-quarter- note' signal, allowing you to synchronise older Roland and Korg equipment such as the TR-808 or DDM110/220 drum machines. Yamaha, XRI and several other make comparable boxes. A similar technique can be used to synchronise patterns programmed into MIDI drum machines. Although some synth modules, such as the Roland MT-32 and D110, now come with built-in drum sounds which you can play with your sequencer, there are plenty of great-sounding beat-boxes like the Roland TR707/909/626, and Yamaha RX21/17, which allow you to create complex rhythm patterns and songs in their internal memory.

Still on the subject of tape synchronisation, you'll also hear talk of SMPTE (Society of Motion Picture and Television Engineers) synchronisation. This is a complex digital time-code system designed to sync music to video, and although SMPTE/MIDI units such as the XRI XR300 are becoming less expensive and straightforward, they're a bit beyond our scope here.

Getting it taped

When recording music, the best advice is to plan out in minute detail what you're going to do, before you do it. Many software sequencers allow you to enter synth patch numbers, track names, and even in some cases little memos. If you don't have these facilities, make a 'track sheet' and fill in all the instrument names and sound patches, the order in which you mean to do the takes, the 'ping-ponging' instructions (see the separate box) and so forth. That way, you'll avoid recording on the wrong track and wiping out two hours' work.

Let's assume you've recorded your piece, added all the necessary effects, and mixed it down onto a stereo master tape. Unless you can afford a quarter-inch mastering machine such as the Revox B77 or Tascam 32, you will probably have ended up with a standard audio cassette. This is fine, because everyone has a cassette player, and not everyone has a quarter-inch stereo tape machine! So now what are you going to do with your music? Maybe you are just in it for your own entertainment. Fair enough, but most of you will want your performances heard. There are loads of possibilities, but, as with any other venture, it pays to do a little research in advance.

Marketing

If you are interested in the production side of music, rather than performance, you can advertise your services as a studio facility. Why not make back some of the money you've spent on your equipment? Advertise in local papers, or publications such as *Melody Maker* or *Music Mart*.

If your clients have access to a computer, stress the convenience of doing the programming at home, then booking studio time and taking in the data disks to finish the recordings. The going rate for a 4-track studio is about £2 per hour, 8-tracks £5, and 16 tracks £10, depending on the amount of gear you have to offer, the area, and the amount of time a band want to spend working.

If you want to promote your own music, work out the most promising market. Let's say your interests are in pop music, and your ambition is to have a hit single, appear on Top of the Pops and be mobbed by schoolgirls. (And why not?) The traditional method of getting ahead is to make a demo tape, send it to a record company, and wait for the contract offers to come rolling in.

Since everyone does this, you will probably have to go one better if you don't want your musical efforts to end up in the 'slush pile'. Some basic rules; select three (magic number) of your best pieces. Don't do any cover versions, and don't vary the style too much; record companies look for a strong sense of identity in an artist. Make sure your cassette is well presented, with neat labelling, and is accompanied by a good photo of yourself and/or your band. Don't give way to the temptation to include a 24-page artistic manifesto with your tape – it'll end up in the bin.

Name dropping

There are several invaluable sources of record company contacts. The best is the *Music Week Directory*, published by Spotlight (01-387 6611) which is an annual publication listing record companies, recording studios, manufacturers and other industry services. It costs £15 from bookshops, or your local library should be able to get it. For more direct information on record companies, try the *Making Music A&R* List. Available from Making Music magazine (01-251 1900) for the price of a big s.a.e., this lists record companies major and minor, their latest signings, what sort of music they're looking for at the moment, and addresses and phone numbers. A&R (Artists and Repertoire) personnel change jobs with miraculous rapidity, so don't expect the list to stay up to date too long.

If you're genuinely interested in a pop music career, consider pressing your own single. It can work out fairly cheaply – around £400 for 1000 7-inch singles with white labels and plain sleeves. Sleeve artwork, coloured labels and so forth all start to bring up the costs, but that isn't necessary if your records are going to be sent out to music magazines, radio stations, TV stations and independent local radio in the hope of airplay (refer to Music Week Directory again).

The two great advantages are (a) record companies will take you more seriously, and definitely listen to your single, and (b) you may get radio airplay, which you will never, ever, get with a cassette demo.

If you are interested in less obviously commercial music – say New Age or folk – make sure to approach record companies specialising in those fields. There's not much point sending a demo of a lilting, lyrical ambient piece to a Thrash Metal label.

JINGLE BELLS

It's possible, of course, that you're happy to stay out of the spotlight, and would like to make music for films, TV and other commercial outlets. This can be staggeringly remunerative; one of the members of funk band Heaven 17 spoke recently of making £25,000 for four days' work on a car company commercial. Sounds good, but of course this sort of work demands the highest standards of professionalism and recording quality. It's no good sending Dixons' cassettes in to ad agencies. Again, the Music Week Directory is a good source of contacts; dozens of jingle companies are listed, and if you want more advice on this area you can contact the Musicians Union on 01-582 5566.

In the meantime, listen very carefully to film soundtracks, ad jingles, TV theme tunes, and so on. Approach organisations such as drama groups, hospital radio stations and 'talking magazines', and see if you can offer them your musical services. With a few commissions under your belt, you'll have a better idea of how the market works.

Many musicians make an excellent living out of 'library music'. Companies such as KPM and Bruton make albums of instrumental music available for hire to all sections of the media. If they like your music, you can sit back and rake in the royalties as your music is used in everything from toilet paper commercials to training films.

GRAPHICS

FUNNY BUSINESS

Cartoon drawing is no laughing matter. Ian Bennett explains the ten steps to becoming an electronic Bill Tidy. All you need is a paint package, a computer, and a little inside knowledge.

Have you ever wished you could draw your own colour cartoons, or even more exciting, comic strip adventures complete with a D.I.Y. superhero of your choice? Armed with your super-power 16 bit paint package of your choice, and a bit (perhaps a lot) of time, you can do just that. All the pictures in these pages were hand drawn using a palette of 16 colours. In fact, the workhorse was an Amiga 500 with Deluxe Paint 2, although they are all fairly simple and basic and almost any paint package on either ST or Amiga would do.

So just how do you go about drawing your own cartoon? Let's look at the stages involved in drawing the final frame incorporating our somewhat skinny but ever-so-dynamic hero, Virus Destroyer, or 'VD' to his friends.

(1) Preliminaries

Unless you are already a cartoonist or comic artist, begin by studying lots of comics noting the use of bold colours, action, shading and all other elements that combine to create a single frame.

Study over Aand then create your character as you wish (or copy another) and then make a basic pencil sketch noting your main colours, shadow areas, action lines and speech areas. If a series of frames is involved then composition of the whole page comes into play... but that's another story!

(2) Switch on

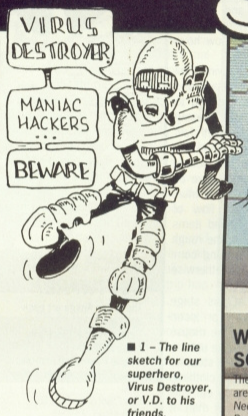
Before loading your art package ensure that you have a supply of ready formatted disks to save your work. It is all too easy to get carried away with the creative urge and forget the essentials, ending up with nowhere to save your labours!

For your first attempts, you will probably find it useful to draw the black outlines for the cartoon on a piece of paper. This will give you a size guide for positioning the different elements of the picture at the right place on the screen. After a while you'll be able to draw the picture directly on the screen.

Have all your reference books, colour charts, preliminary sketches and inspirational work handy. Clear away the half empty coffee cups, put out the cat, the wife/husband, settle down and switch on.

(3) Palette

Setting up a definitive palette at the start is not vital, since you can always change it, but preparing major colours like the red, yellow and blue of V.D.'s uniform is advisable. Set the screen background colour to a fairly neutral, restful shade to avoid eyestrain... you could be in front of the screen for some hours, maybe days. Don't have a black background because black is needed for drawing lines, and white for speech balloons and highlights. If your character has body parts showing, then a flesh colour (human, alien or otherwise) will be needed. Always try to leave spare colours for the various shades of the main ones that will crop up as a drawing progresses. Be prepared to continually modify and remix shades as you proceed. It is one of the joys of computer art!



■ *1 – The line sketch for our superhero, Virus Destroyer, or V.D. to his friends.*

(4) – Box it

Usually your cartoon or illustration will be inside a box. Using a fairly wide square brush and the hollow rectangle command, set up your drawing area to whatever shape is required. It is important to remember that if you

WHICH ST SOFTWARE?

The major ST art packages are:

Neochrome (Atari), £29.95

Degas (Electronic Arts), £24.95

Spectrum 512 (Eidersoft), £59.95

Art Studio (Rainbird), £24.95

DR Draw (Softwood), £49.95 incl. *Film Director*

GFA Artist (Michtron), £49.95

Quantum Paint (Eidersoft), £24.95

Cyber Paint (Electric), £69.95

Easy Draw 2 (Electric Distribution), £59.95

TIPS OF THE TRADE

Solid black outlines and dark shadows play an important part in most comic pictures. Look at the way simple black lines are used to denote muscles, for instance on the biceps or thighs. Look for areas of shadow particularly under the neck, arms, rib cage and also the way that thick black lines and shadow combine to create that superhero chest. Solid muscle! In the examples drawn on these pages, shadow is strongly evident in body parts behind the main action, as in the VD final frame with the rear arm and lower raised leg.

The use of solid black lines eliminates the need for complex colour shades and if you have only 16 colours as with the Amiga medium resolution or ST low resolution, they soon get used up. In the VD final frame there is only one shade each of blue, yellow and red used. Black shadow and lines combine to create the 3D effect.

Commodo

intend to have explosive action, body parts or speech breaking out of the box boundaries, then you must leave sufficient space must on the screen to accommodate it. You soon see the need for that preliminary paper sketch.

(5) Let's draw

At last! If you are keen on art, you will presumably already have some knowledge of perspective, composition, figure work etc. If you haven't, then you would be wise to obtain some from a decent drawing or sketch book. Whilst comic and cartoon work can sometimes flout the general laws of drawing, it is easier to learn to draw first and then to learn to draw 'comics'. Getting a 3-D effect is easy when you know how, impossible when you don't.

Having set up the drawing box select a thin brush, colour black and pick your starting point. Proceed to 'sketch' with the mouse. Keeping your eyes on the screen and with fairly rapid movements, outline the main picture as you would with a pencil on paper. If drawing an action figure as our V.D. is, start with a 'stick man' which captures the main flow of movement. Basic background items can be put in to complete the rough sketch, using the line drawing command where you can, but otherwise with freehand sketching.

Don't waste time at this stage removing all unnecessary or incorrect lines. Sketching with the mouse takes practice, so do not give up!

'Fleshing out' is the next step, ie. putting a body and relevant clothing, uniform, gadgets, weaponry etc (still fairly roughly) onto the stick man. If you hero is a muscle-man type, there will be lots of curves to draw for bulging biceps an so on. You could try to use the curve drawing commands of your art package, but many people prefer to draw these free hand instead since they will probably be redrawn when the detail stage is reached later. But feel free to experiment for yourself.

In drawing a face, you may wish to insert a centre guideline through the nose and also an eye line passing through the centre of the eyes. These lines can easily be removed by 'overdrawing' with the relevant flesh or other colour once the mouth, nose and eyes are finished.

Weapons will usually be based on straight lines, and a simple set of line and box commands can be used to create the weapon's outline.

Now before you do anything else, SAVE IT!!!

(6) Now undraw

After the end of the last stage, you will have a mass of lines on screen (especially if there is a background scene) – the sense of which is only apparent to you. Hidden amongst the spaghetti will be your hero desperate to reveal himself (*Shocking! And this a family magazine – Ed*).

So now, we undraw. Select background colour, the largest brush size you need and 'draw over' all the obviously unnecessary lines. After removing the major ones, eg. the sticks from your stick man, use the magnify command and zoom in to remove other lines. Keep removing lines and doing minor redrawing until you are left with a figure that's rough around the edges but a pretty reasonable outline sketch. Save it again and take a break!

(7) A bit of colour

Adding some colour at this stage will let you feel that you are getting somewhere fast. The flood fill command can, in seconds, change a mass of lines into a mass of coloured blobs. But at least, you will know what the blobs are. Check that all lines join up where necessary and use the magnify command to examine all dubious bits. A slightly misplaced pixel, especially after free-hand drawing, is extremely difficult to spot. You will soon know if there are any gaps that you were unaware of when the whole screen fills with the wrong colour. Thank heavens paint packages with Undo command!

Do not add too much colour at this stage. Start with the main areas like the head, chest and arms. You can also insert the main areas of shadow such as rear arm, raised rear leg and ribs.

(8) Magnify and detail

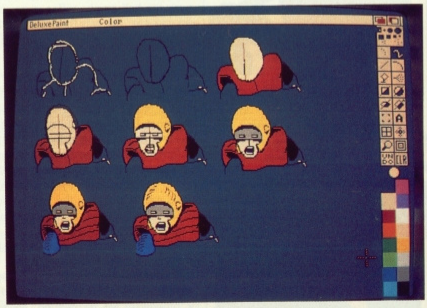
This is the stage at which the real drawing takes place. For the figure, add detail from the head down. Use the magnify command, a small brush and first correct and establish the final shape for the head. Add the helmet, main head shadow and shoulder areas.

Working at increased magnification allows detailed work on the facial and other features. The amount of detail depends greatly on the final purpose for the picture and its ultimate size. One of the arts in cartooning, is to only put in sufficient details to create the impression required. Many top cartoonists use very few lines to create their figures with, and fine detail is lost anyway if the results are printed small.

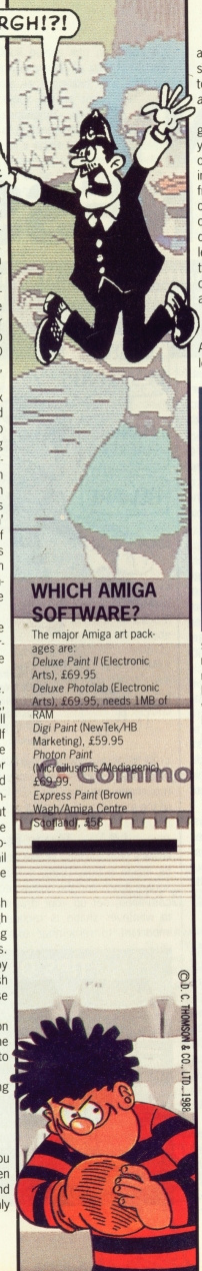
Detailed work ultimately comes down to using the magnify command and small brush to work pixel by pixel. Good art packages display the

◄ *2 – Start by drawing the centre lines of your figure in stick fashion*

► *3 – Add the outlines for the limbs around the centre lines*



■ *4 – It lives, Dr. Frankenstein... colouring in the head brings friendly V.D. to a semblance of life. The menus and palette reveal this as a Deluxe Paint II production, but you could use any art package on any machine.*



WHICH AMIGA SOFTWARE?

The major Amiga art packages are:
Deluxe Paint II (Electronic Arts), £69.95
Deluxe Photolab (Electronic Arts), £69.95, needs 1MB of RAM
Digi Paint (NewTek/HB Marketing), £59.95
Photon Paint (Microillusions/Mediagenic), £69.99
Express Paint (Brown Wagh/Amiga Centre Scotland), £58

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■ 5 – *Add in a background colour and some black 'motion' lines*

magnified and unmagnified portions on screen at once – always keep an eye on the un-magnified image to see the effect of your actions. Repeat this detailed work for the rest of the picture, using the preliminary sketch as a basis and redrawing, correcting and finishing as necessary.

At the risk of becoming repetitions, SAVE IT NOW!

(9) Backgrounds

Having previously established any background details with the initial sketch, everything now comes down to the magnify and detail procedure. Don't be afraid to redraw detail, your preliminary sketch was only a sketch. Magnifying at this stage is also necessary to remove unwanted pixels left from the outline sketch.

The amount of detail which goes into the background will depend upon the final purpose for the artwork. In the 'sleazy street' scene very little background detail was necessary despite the fact that the illustration shows a landscape scene. The foreground detail is the main focal point of the picture.

If you wish to know how much detail to put in, again look at various comic strips especially the standard Superman and Batman type. You can see quite often that background details like buildings are represented simply by outlines with various colours used for obtaining depth; final detail itself is strictly limited.

(10) Speech and lettering

Before going any further, make sure that you have saved the frame so far. You are almost finished... it's silly to take risks now.

Whilst drawing, consider the location of any lettering and speech balloons required. If you are uncertain where to locate the balloon then draw it separately, save it as a brush, and move it around the frame until it looks good, then click the mouse to fix it in position. The balloon shapes can be whatever you wish depending upon the desired effect. Freehand drawing will often give a better cartoon effect than using set shape commands, but boxes and ovals can be useful.

As for lettering, well play around with whatever fonts you have available. Experiment with bold, italic and any other features. The V.D. strip has a variety of fonts and spacings.

If the words are not large enough then you can use the art package's stretch, rotate, reflect and other features to get the effect you want. Always fill the speech balloon with the background colour *before* inserting any lettering. Otherwise, you are left with all the centres of the letters to fill in individually.

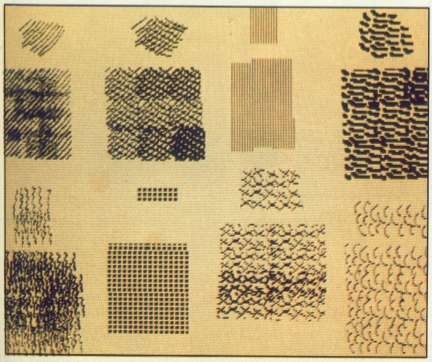
WASTE NOT WANT NOT

Look for short cuts that allow you to re-use things you've already done. All paint packages have a copy command: if you spend some time perfecting a left eye, copy it to a blank area of the screen, then reflect it for use as a right eye.

Amiga art packages, and also Degas among others on the ST, have a particularly powerful copy and move function called 'brushes'. You can pick up any area of the screen and use that as a brush to draw with. The brush can be flipped, resized or rotated all without you needing to find a blank area of screen to use as a scratchpad.

Looking at the completed strip at the end, the computer and telephone keys were all done with a 'key' brush, and the stencil command was used to draw underneath and out from Alfred's arm with the brush.

If Leonardo had owned an Amiga perhaps the Mona Lisa wouldn't have had that lop sided smile?



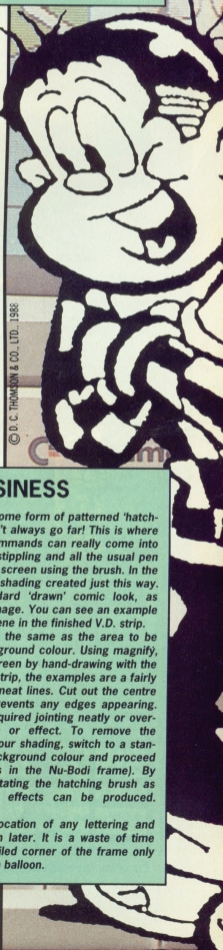
■ *A selection of hatching patterns you might like to recreate and use to give texture and depth effects to areas of your cartoon. Select a pattern, modify the background colour to match the destination area, and use your paint package's copy commands to splash it over the parts you want.*

SHADY BUSINESS

To break up a solid block of colour, some form of patterned 'hatching' can be used. Sixteen colours don't always go far! This is where paint packages with proper brush commands can really come into their own. Hatching, cross hatching, stippling and all the usual pen and ink effects can be reproduced on screen using the brush. In the V.D. strip you will see a lot of simple shading created just this way. It also helps to maintain the standard 'drawn' comic look, as opposed to a precise computerised image. You can see an example of this by the doorway of the street scene in the finished V.D. strip.

Ensure the background colour is the same as the area to be shaded or drawn onto the main background colour. Using magnify, if necessary, hatch a small area of screen by hand-drawing with the style of shading required. In the V.D. strip, the examples are a fairly rough effect, but you could use nice neat lines. Cut out the centre portion only as your brush, which prevents any edges appearing. Work with the brush over the area required jointing neatly or overlapping where necessary for depth or effect. To remove the squared step effect at the edges of your shading, switch to a standard circular brush with the right background colour and proceed to shape the edges as required (as in the Nu-Bodi frame). By enlarging, reducing, stretching or rotating the hatching brush as needed a wide range of different effects can be produced. Experiment!

Finally, bear in mind also the location of any lettering and speech balloons which you will put in later. It is a waste of time spending hours creating a finely detailed corner of the frame only to cover it up with a large white speech balloon.



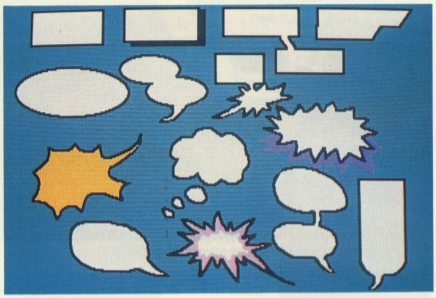
■ *6 – Drawing in the frame outline with a thick brush, leaving room for text to run beneath.*

Finally, if you have not already done so, add the background colour for the box. You should have left yourself at least one shade on the palette. Remix as necessary, you will be amazed at the effect that different colours in the box can have on the final impact of the frame

Up, up and away

So there you are, your own dazzling hero. All that remains now is to preserve your creation for posterity. If you don't have a colour printer you can photograph the screen, using an exposure time of about 1/2 a second which smooths out the scanning lines on the monitor display.

Have fun... it's what comics and cartoons are all about!



■ *Picturesque language... a variety of speech bubbles. Text you want to emphasise can be put in one of the more esoteric shapes.*

VIRUS DESTROYER
VIRUS DESTROYER
THE BEGINNING.
ONCE UPON A TIME, YET TO COME, COMPUTER GAMING WAS ENJOYED THROUGHOUT THE KNOWN GALAXY.
ONE STELLAR DAY ON THE PLANET AMIGA, A SOLITARY GAMER, CALLED ALFRED WAS LOCKED INTO A GAME...
UNABLE TO ABANDON HIS SCREEN FOR TWO MONTHS, ALFRED WAS NOW ON THE BRINK OF FINDING THE FINAL ANSWER WHEN....
SUDDENLY ON THE MONITOR
YOUR COMPUTER IS A LIVE BOMB.
TAKE COVER
OH NO! A VIRUS.
KABOOM!
ALFRED LOST CONTROL
THE VIDPHONE YELLOW SCREEN SHOULD HELP
AHH! THIS IS THE ONE!
THIS MEANS WAR!
A RAID ON HIS GAME SAVINGS CAME NEXT
I DON'T THINK THE KRYSTLE WILL BE OUT THIS EON ANYWAY
LATER ON...
NU-BODI
I'M SURE IT'S AROUND HERE SOMEWHERE
VIRUS DESTROYER
MANIAC HACKERS BEWARE
KNOWN AS 'VD' TO HIS FRIENDS
PART HUMANOID, PART COMPUTER, ALFRED WAS NOW THE SUPER HERO THAT SUPER VERBS DREAM ABOUT.
HIS GOAL – THE ELIMINATION OF ALL THOSE MAD VIRUS CREATORS IN THE GALAXY THAT RUIN THE LIVES OF ALL COMPUTER GAMESTERS.
THE END OF 'THE BEGINNING' OR IS IT THE BEGINNING OF THE END FOR SOME?
NU-BODI SLOGAN: "IF YOU CAN DREAM IT, WE CAN MAKE YOU INTO IT!"
ALFRED WENT IN.
COME ON IN THE WATER'S FINE!
TWO DAYS LATER AND ALFRED WAS NO MORE.
OUT OF THE DOOR STRODE...
ALFRED LOST CONT
THIS MEANS WAR!
KABOOM
CRASH!
I'M SURE IT'S AROUND HERE SOMEWHERE...
...IN A SLEAZY PART OF TOWN...
NU-BODI SLOGAN: "IF YOU CAN DREAM IT, WE CAN MAKE YOU INTO IT!"
COME ON IN THE WATER'S FINE!
ALFRED WENT IN...
TWO DAYS LATER AND ALFRED WAS NO MORE...
OUT OF THE DOOR STRODE...
VIRUS DESTROYER
AD TO HIS FRIENDS 'AD'
PART HUMANOID PART COMPUTER ALFRED WAS NOW THE SUPER HERO THAT SUPER HEROES DREAM ABOUT...
HIS GOAL... THE FINAL ELIMINATION OF THE MAD VIRUS CREATORS THAT RUIN THE LIVES OF ALL COMPUTER GAMESTERS...
THE END OF THE BEGINNING OF THE BEGINNING OF THE END

Out of the formless void comes a new kind of superhero, from initial sketch to final coloured screens.

NEW FROM ROMANTIC ROBOT

MULTIFACE ONE, the MULTIpurpose interFACE, was a sensation when originally released for the ZX Spectrum four years ago. MULTIFACE TWO, for the Amstrad CPC range, followed 2 years later — same pattern, same success. Now the time has come for the MULTIFACE ST — the BIG brother to the MULTIFACE family. Same pattern? Yes, and with even more facilities! So, what can MULTIFACE ST do to make an ATARI ST owner's life so much easier?

MULTIFACE ST is the ultimate PERSONAL COPIER. It copies programs, screens, disks — all at a touch of a button. Its most powerful MULTI TOOLKIT lets you study & modify any program any time — just touch the same magic button. How is it done?

MULTIFACE is a small box that plugs into the cartridge port. It has all its tricks in a massive 64Kbyte ROM so you do NOT need to load any other software: MULTIFACE is always there and ready. It is menu-driven with one-touch commands and on-screen instructions, so easy to use. Pressing its magic button will interrupt any program and give you an overall control over it. You can save the entire program or just the screen. MULTIFACE compresses before saving and it formats disks with up to 25% gain, to make the contents of the computer fit onto a disk. The saved program will continue from where it was saved — save half-way through a game and avoid playing from the start again!

The MULTI TOOLKIT lets you inspect and change (in hex, decimal and ASCII) absolutely everything — including the protected RAM and 68000 registers! You can POKE infinite lives, customize programs, fill RAM, find/replace strings, even m/c instructions, etc.

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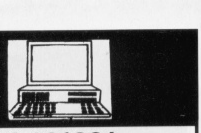

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DTP UPDATE

Since our mega-survey of ST and Amiga desktop publishing software in issue 2, there have been a couple of new developments. Ben Taylor examines Shakespeare 1.1 for the Amiga, and Simon Williams checks out the new version on Timeworks DTP on the ST.

AMIGA

SHAKESPEARE 1.1

£148.35 ■ Amiga only, all models ■ Cloudhall Ltd, Bensead House, 40 Hazelwood Road, Northampton NN1 1LN (0604 231211)

Shakespeare is a relatively new Amiga DTP package, which missed out on our grand survey in issue two. The newly released version 1.1 seems much more robust than the original 1.0, and certainly merits a close look. Proudly labelling itself 'Shakespeare – The Page Integrator', the program claims to be particularly strong in the area of colour DTP. And after all, colour is the Amiga's strength – what's the point of being able to paint multicoloured pictures on art packages when you can only print them out in black and white on a DTP page?

Shakespeare will run on an unexpanded A500, which is a pleasant surprise (many of the higher-powered Amiga packages disdain users with 512K), although the manufacturers recommend 1MB for serious use. The package comprises two disks, one being the program disk and the other having a varied selection of tutorials and Clip Art covering computers, road signs (!) and holidays.

Flowing prose

There's a curious mix of the conventional and the unconventional throughout the package: as you expect, before you can place any items on a page you first have to define your page size, and then create some empty 'boxes' to put the text or graphics in. There is no distinction between the two types – you've only got one frame-creator tool, and either text or graphics can go into them, although the two can't be mixed.

You have to 'preload' all the text and graphics files before you place them in boxes. On a menu curiously named 'Chart', you click on all the text and graphic filenames, load them into memory, and them place them one at a time into their boxes. At least this way you know when you are going to run out of memory for your page *before* you start to lay it all out.

Text flows into the boxes quite rapidly, and you can set your font before or after. You are restricted to the font sizes supplied on the disk, which range from 8 point to 38 point in various typestyles. There are 72 points to the inch, by the way, so 38 points is about half an inch high. This isn't very large for a headline, so you'd have to import larger sizes as graphics.

One annoying feature is that imported text loses all its bold and other emphasis commands, no matter what word processor it was prepared with. You can use the editing facilities with Shakespeare to re-italicise whatever you want, and you can mix any number of different styles, fonts and sizes in a text box. Text can be edited directly on-screen within a box, unlike *Page Setter* and *City Desk* where you have to go into a separate text editor.

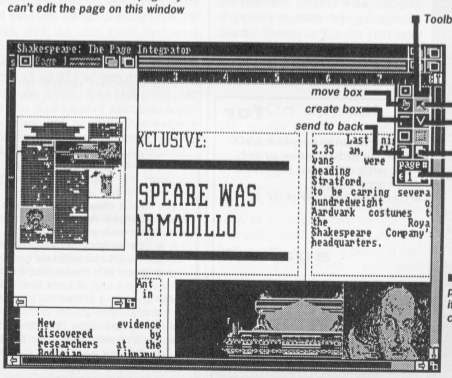
Graphics

To import graphics, they should have been saved as a 'brush' from an art package. This format allows you to resize and crop the graphic after importing it. There is no graphics editor within Shakespeare for knocking up quick graphs, nor any graphic-drawing tools at all. You can't draw circles; a rectangle has to be an empty text box with a border; a line

POSTSCRIPT POSTSCRIPT

Shakespeare can print files directly to a PostScript printer or save them as PostScript files to disk for a DTP bureau to print out for you. However, no standard PostScript screen fonts like Helvetica or Times come with the system, and it converts Amiga fonts to PostScript when printing (eg. print Topaz text in Courier font). This isn't a very good solution, since the screen character spacing can get out of sync with the different printer fonts.

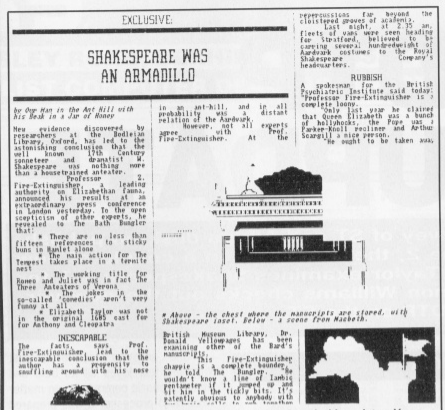
■ *An overview of the full page – you can't edit the page on this window*



■ *You can overlay one picture with another, even if they have different colour palettes.*

■ *Shakespeare's editing screen*

■ *This column rule is actually a very long thin box!*



EXCLUSIVE:

SHAKESPEARE WAS AN ARMADILLO

by Our Man in the Act Hill with Ace Reporter

New evidence discovered by researchers at the Bodleian Library, Oxford, has led to the astonishing conclusion that the well known 17th Century spoonteer and dramatist W. Shakespeare was nothing more than a boastful armadillo.

Fire-Extinguisher, a leading authority on Elizabethan fauna, announced his results at an extraordinary press conference in London yesterday. To the open scepticism of other experts, he revealed to The Bath Bungler that:

* There are no less than fifteen references to sticky buns in Hamlet alone.
* The first action for The Tempest takes place in a termite nest.
* The working title for Romeo and Juliet was in fact The Three Anteaters of Verona.
* The jokes in the so-called 'comedies' aren't very funny at all.
* Elizabeth Taylor was not in the original 1605 cast for Fur Anthony and Cleopatra.

INESCAPABLE

The facts, says Prof. Fire-Extinguisher, lead to the inescapable conclusion that the author has a propensity to snuffling around with his nose in an ant-hill, and in all probability was a distant relation of the Aardvark. However, not all experts agree with Prof. Fire-Extinguisher. At the repercussions far beyond the cloistered groves of academia.

Last night at 2.30 am, fleets of vans were seen loading up far Stratford, believed to be carrying several hundredweight of Hardwick costumes to the Royal Shakespeare Company's headquarters.

RUBBISH

A spokesman for the British Psychiatric Institute said today: "Professor Fire-Extinguisher is a complete loony.

"Only last year he claimed that three literary fakes were a bunch of bilberry buns. Four years ago he claimed a recliner and Arthur Scargill's nice person.

"He ought to be taken away.

* Above - the chest where the manuscripts are stored, with Shakespeare inset. Below - a scene from Macbeth.

British Museum Library, Dr. Donald Yellowgrey has been examining either of Bard's manuscripts.

Fire-Extinguisher chuckle is a complete bounder, he told The Bungler. He wouldn't know a line of Iambic pentameter if it jumped up and bit him in the tickly bits. It's patently obvious to anybody with

■ *A final page printout, done on a 9-pin Epson black and white printer. You need to choose your picture's colours carefully – here the picture of Shakespeare that you can see in the screen shot has printed out white-on-white – hence the blank gap in the main picture!*

There is no concept of a 'tab' or fixed paragraph indent in Shakespeare. When you justify text in a column, as on this page, each space is adjusted to pad the line out, so it is very hard to get regular size indents at paragraph starts.

has to be a one pixel wide text box with a border.

Text won't autoflow text around graphics. You need to carefully construct your text boxes so they don't interfere with the graphic items on the page. This is a bit naff for a high-priced DTP system.

One of Shakespeare's strong points is its handling of colour graphics. The screen can only display four colours at a time, but the graphic information is in fact stored to 32 colours. Furthermore, if two or more graphics were created with different palettes, eg. 64 different colours in total, they can still be printed out with their correct colours even though the screen display will look a bit strange (the screen palette changes according to which graphic is currently active).

Shakespeare is poor on zooming to work on the page at different sizes. You've basically got no choice; work at full size (as in the sample screen dump shown in this review) when you can't see the whole width of the page at once, or inspect with a full-page overview, a miniscule size at which you can't edit.

Driven dotty

Printer insallation is one aspect of Shakespeare which makes it extremely cumbersome to set up. You have to know how many dots per inch your printer supports, and the screen is then set up to match. On a 9 pin printer, which may be 120 by 72 dots per inch, the page takes up less space on screen than a 24 pin printer which works at up to 180 by 180 dots. Because the page aspect ratio is customised for your printer, you've got to set your Printer Preferences up just right, and if you have two printers (maybe one for drafts and one for final copies) you can't print the same document out to both if they have different pin densities.

The advantage of this system is that the correspondence between screen display and printed output is very good when you set it up properly. Graphics can be resized very well, and still print out without jaggies. Printout is quite fast, mainly due to the Workbench 1.3 printer drivers supplied with the kit.

UP AGAINST THE REST

So how does Shakespeare compare with the other Amiga DTPs, Page Setter, City Desk and Professional Page?

In many respects Shakespeare falls between two stools. It is too expensive to oust City Desk as the home user's favourite, and it doesn't compete with Professional Page as a power user's workhorse.

On the plus side, Shakespeare has excellent handling of colour graphics. Owners of colour printers will really appreciate being able to print out any number of colours on a page regardless of the fact that only four can be displayed on screen at once.

Text handling is adequate, but not being able to automatically flow text around graphics boxes is a bit of a blow. The dot matrix printout is a good representation of what's on the screen, the fonts come out well (compared to Professional Page, where if you don't have a PostScript-compatible laser printer the output is very poor.)

Overall, once you've taken the trouble to set Shakespeare up for your printer the quality of text output can be quite good. Because all text style are lost when text is imported, it isn't suitable for long text documents; as a 1-page colour poster preparer, Shakespeare is fun to use, but as a fully fledged DTP system it fails to impress.

features 0 1 2 3 4 5

performance 0 1 2 3 4 5

ease of use 0 1 2 3 4 5

manuals 0 1 2 3 4 5

format value 0 1 2 3 4 5

for

- Runs on unexpanded A500
- Can include colour graphics with different palettes in same page
- Can edit text directly on page

against

- Needs to be closely tied in to a specific printer
- Loses styles of imported text
- No zoom commands
- No auto reflow
- No graphics editor

SHAKESPEARE UPDATES

If you have a copy of Shakespeare 1.0, the early version, you'll want to know what's changed. Apart from fixing a few bugs and making the program more robust, the main additions are:

■ *The Amiga's SetMap command is now properly recognised, so you can get the UK character set on screen.*

■ *When you import text from an ASCII file, which usually has a hard return at the end of each line, Shakespeare 'intelligently strips' the returns out to give you a continuous paragraph.*

■ *Alignment guides are shown on screen as you move boxes around. These are extensions the edges of the box right across the screen, so you can line it up with other on-screen items.*

■ *You can now divide a page into equal columns for text (with rules inbetween) with a single command, rather than drawing each column manually.*

■ *You can scroll the page by dragging it with the 'move' tool*

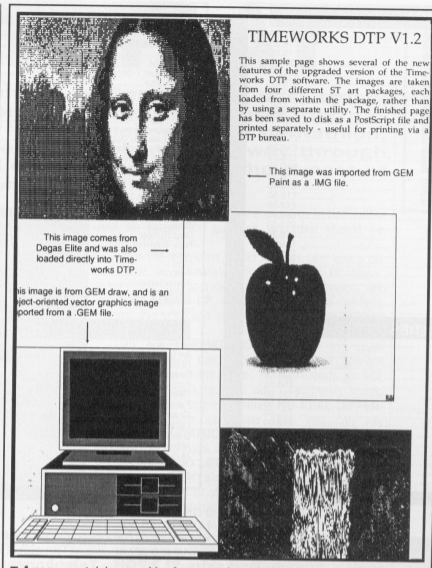
ST

TIMEWORKS DTP

£99.95 ■ ST only, all models ■ Electric/GST, 8 Green Street, Willingham, Cambridge CB4 5JA (0954 61258)

Timeworks DTP was designed to be an inexpensive Desktop Publishing program to rival more costly offerings like *Ventura Publisher* on the PC. It was reviewed in Issue 2 of *Format*, but since then has undergone some improvements to raise its version number from 1.05 to 1.12. The price remains a very modest (for a DTP) £99.

The improvements range from more accurate line-art resizing, to the ability to print a PostScript file to disk. This last feature is not everything you might expect, though, as you can only print to disk if your ST is equipped with a hard disk. This might be reasonable on the lower memory 520 and 1040 STs, but there seems little reason why the file conversion couldn't be adequately handled in memory on the Megas. The main advantage of printing to disk is that you can produce top quality DTP pages without the necessity of expensive hardware such as PostScript laser printers... and hard disks!


TIMEWORKS DTP V1.2
This sample page shows several of the new features of the upgraded version of the Timeworks DTP software. The images are taken from four different ST art packages, each loaded from within the package, rather than by using a separate utility. The finished page has been saved to disk as a PostScript file and printed separately - useful for printing via a DTP bureau.
This image was imported from GEM Paint as a .IMG file.
This image comes from Degas Elite and was also loaded directly into Timeworks DTP.
This image is from GEM draw, and is an object-oriented vector graphics image imported from a .GEM file.

■ *A page, containing graphics from a variety of different packages, all printed out under PostScript.*

Extra file compatibility

The problems experienced with leading of text in the earlier version seem to have been sorted out, and you can now specify a leading smaller than the point size of the text. Most of the other additions to the program are to increase the level of compatibility between the DTP and text and graphic programs. *Word Perfect* has been added to the list of supported word processors, so it's now possible to take in text in this file format. On the graphics side, the screen font format has been reconciled with that used by *Easy Draw 2* to make import of these pictures easier. Both these two additions seemed to be geared towards the American market – since there are more STs in the UK than there are in the USA, it might have been better for GST to work with Arnor on *Protext* compatibility, for instance.

The other interesting addition to *Timeworks DTP* is the ability to print in landscape mode. This means printing along the length of the paper rather than across its width and is particularly useful if you want to print a Double Page Spread (DPS) which will eventually been folded to produce the finished document. Since the paper still moves through the printer in the same direction, this involves printing characters sideways down the page.

On appeal

The original verdict on *Timeworks DTP* was very good, with particular praise for its handling of long documents. This verdict still stands, with the improved features adding to its value for money. There are still areas, such as printing to disk on non-hard disk STs, which would benefit from further work, but with a policy of continuous improvement, no doubt Electric and GST are looking at these.

features	**4.0**
performance	**4.0**
ease of use	**4.0**
documentation	**3.0**
format value	**4.0**

ALREADY THERE

The original product already has many of the features you should expect from a serious Desktop Publisher. It uses GEM to provide a WYSIWYG display of a portion of your finished page, but can also show reduced size displays to give an impression of the the layout of the entire page, or a DPS. Text can be imported from a number of leading ST word processors, maintaining formatting commands and some text effects, like bold text and underlining. Similarly, graphics can be imported from most of the popular drawing packages, including Degas Elite and Neochrome. Timeworks can work in monochrome or four colour medium resolution displays, and the low-res graphics of Neochrome are automatically converted on import.

The main advantage of Timeworks over most of its rivals is its ability to handle multi-page documents with ease. It does this through a system of 'stylesheets' which let you define a particular set of font characteristics and assign them a name for a particular part of your text (like 'headline', 'caption' or 'body copy'). You can then tag text within a document with a given style, and it will take on the complete set of attributes in one go.

The program is designed to print on any printer from a 9 pin dot matrix, through 24 pinners, the Atari and HP lasers up to a PostScript laser which can cost five times as much as an ST4. You can only install a single printer driver at any one time, which means you can't run a draft dot matrix as well as a final copy laser.

The manual runs to 120 pages, but has no index, and the original program came on four disks which require a fairly long-winded, but easy to follow installation routine.

ON THE UPGRADE

If you have version 1.05 of Timeworks DTP you can upgrade to the new version for next to nothing. Return your current disks with a cheque to Electric Distribution at 8 Green Street, Willingham, Cambridge CB4 5JA. If you have registered with Electric's Softline service, write £4.95 on the cheque, otherwise make it £9.95. That's not at all bad for a set of five disks and a sheet documenting the new features.

Syntax

AMIGA

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SCREENPLAY

Despite the best efforts of September's post strike, the games just kept on coming. Andy Storer, narrowly passed over for the Olympic modern pentathlon, shoots, swims, steers and schemes his way through the months finest before riding off into the sunset of New Computer Express.

REVIEW

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FORMAT GOLD

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Only 14 games made it to the post-box in September and no prizes for guessing why that should be. Thanks, Royal Mail.

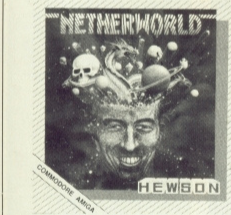
After the lost limos, liquid lunches, and disco dinners that we journalists refer to as 'The PC Show', even more copy got delayed. To make amends, and generally **SOBER UP**, we decided to come out fighting for this one, and so there's 10 reviews awaiting you.

Only one **FORMAT GOLD** qualifier this issue though; *MENACE* has hardly been off our screens since it arrived in the office. As our friends on ACE are only too quick to point out – Psygnosis should bring it out as a coin-op. There's **NO REAL DIFFERENCE**. It'd clean up faster than you can say **SEGATAITOKONAMICAPCOMJALECOSNK**.

ELITE would have easily qualified too if we didn't believe there's **NO LIFEFORM IN THE ENTIRE UNIVERSE** that doesn't already know it inside out. Maybe this isn't true for all of you – in which case we ask, "What planet are you from, Matey?" Seriously though, it's great to see it updated and we wait with baited breath for the transputer versions.

FUSION might replace adventure with puzzle-solving but you'd be hard pressed to find any game with more **STYLISH ARTWORK**. We're talking **SERIOUS DEFINITION** here with coloured abstract backgrounds that should be screen-dumped to the Tate forthwith.

The **RELIEF MAPPING** in *STARGOOSE* is pretty groovy too. There's no way Logotron's **FULL BEEF SCROLLER** could be called **HAMMY** but there again we prefer our beef a little more overdone. Nevertheless, it's definitely worth a gander if only to catch a glimpse of the **TRULY PSYCHEDELIC** tunnel sequences.



There's plenty of beef but less fine art to be found in *P.O.W.*, save for the **ART OF WAR** of course – and some funky monkeys wearing sunglasses, but then the only colour that matters in this **POST-VIETNAM CARNAGE EPIC** is red. If only U.S. Action had sent us the **LIGHT PHASER GUN** that goes with it we could have all signed up for *RAMBO IV*.

Which isn't exactly a million miles away from *VETERAN* – a Yugoslavian import featuring sampled battlefield sounds so **EXCRUCIATINGLY REAL** our Art department have taken to wearing Combat Fatigues whenever we boot it. It's the grenades they carry we object to.

On rainy days we swap our boots for flippers and engage in a spot of **SUB-AQUATIC COMBAT** in *OPERATION NEPTUNE*. *All the graphics may take place under the surface but then it's riding the* **FRENCH NEW WAVE** along with all the other Infogrames releases. Let's not forget Loriciels while we're at it.

Finally, we throttled back on *SUPER HANG-ON* and wheelied our way around the world. We'd just cleared the **JUNGLES OF NORTH AMERICA** in record time when we hit a warp and found ourselves in *NETHERWORLD*; a curious place if there ever was one. This dimension can get pretty strange but Netherworld makes even the Format office look normal. And that's saying something – how many offices do you know that have posters of **NAKED ARMADILLOS** on the walls?

LATE CHANGES

It is with deep regret that we announce the passing of Andy Storer, games reviewer extraordinaire. "Die, alien filth," was his jolly catchphrase at the console.

Andy's off to PUNCH DECK for our new baby sister magazine, the weekly NEW COMPUTER EXPRESS. Out mid-November, 48p every week, the FIRST news, the FIRST reviews. (That's enough free advertising – Ed). Catch his achingly witty games reviews there.

In the meantime, Mark Higham joins the Format team as the new games supremo. Can our reviews get EVEN BETTER? – Of course they can! Watch this space...

Since completing the review of Operation Neptune it has come to our attention that the version reviewed is a development copy not intended for assessment, and is likely to show significant improvements when the final production version is released.

As with any monthly magazine, we strive to be the first to bring new products to the attention of our readers. To be fair to Infogrames, though we will update our review to reflect the final features of the game as soon as we receive a production copy. This will still be before the product is finally launched.

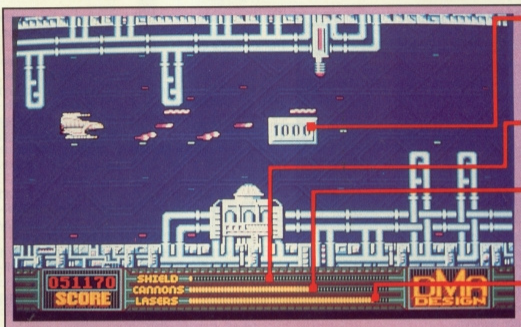
MENACE

FORMAT GOLD

PSYGNOSIS

Amiga – £24.95, Mouse or Joystick	ST – £24.95. Due October.

The first release from Psygnosis's new label Psyclapse is a scrolling shoot 'em up which betrays the unmistakable influence of popular arcade games like *Nemesis* and *Salamander*. Menace, originally known as Draconia but since renamed, provides some of the best arcade action yet seen on the Amiga. Past releases of this genre have been lacking in gameplay but Menace points the way to a rosier future for Amiga gameplayers with its arcade quality graphics sound and above all, exceptional gameplay.



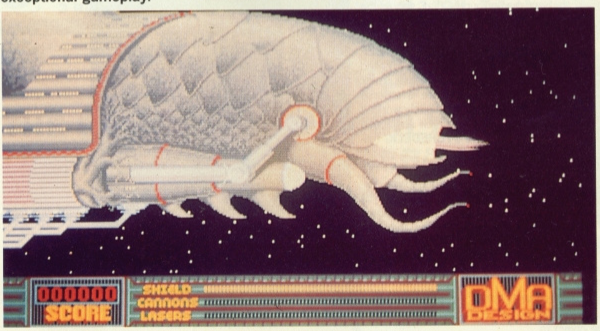
■ *Shoot the icon to collect extra weaponry and ammunition.*

■ *Shield Strength. If it hits zero it's all over.*

■ *Number of shots left from your cannons, currently healthy.*

■ *Lasers are at full capacity and ready to let rip.*

▲ *You've just destroyed a wave of aliens and it's time to reap the rewards.*



▲ *A huge Space Slug is your transportation to Draconia. Cute little fellow isn't he!*

AIM

Far into the future, six feared tyrants have come together to reek vengence on the Universe. Using matter collected from other planets they have destroyed, the planet Draconia has been 'restyled'. All the other inhabitants of the Universe are less than keen about this. Something has to be done to save the people of the Universe and after much deliberation, guess who has to go in alone in a single seat fighter, against impossible odds and destroy Draconia before it is too late. Oh, you *are* clever...

STRATEGY

The gameplay is fairly straightforward, using either a mouse or a joystick to guide a small fighter through six levels of increasingly difficult zapping. As usual your presence doesn't go unnoticed, and the inhabitants of Draconia throw everything they have at you in one frenzied attack after another.

Each of the six levels moves the battle into a different area of Draconia, from the exotic landscapes of the Sea of Karnaugh and the beauty of the tropics of Mace, to Carnage Rift, which looks more like a scene from *The Evil Dead* than a planet's surface.

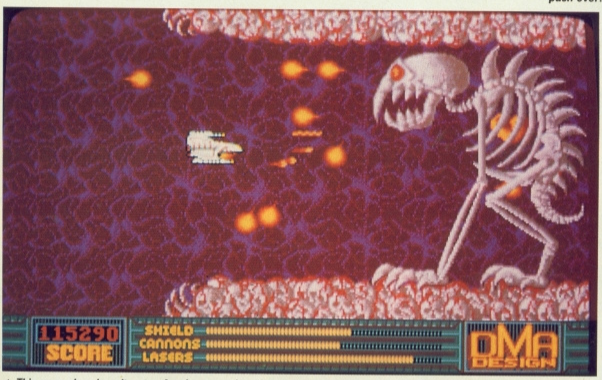
Menace features over sixty different types of alien, all of which are hell-bent on your destruction. Most can be dispensed with fairly easily with a few quick blasts from your ship's lasers but others are more stubborn. To increase your chances, extra weapons can be collected and recharged en route, by shooting the bonus score icons at the end of each stage. Weapons include high power lasers, rapid fire cannons and inertia-controlled outriders. Add both lasers and cannons to your ship and alien-wasting moves into top gear.

End of level guardians are the last challenge on each level and fire multiple salvos in your direction. A mixture of dexterous flying, frantic mouse bashing and a lot of luck should get you past the guardian and onto the next level. Tooling up for these meanies is the name of the game in *Menace*, though, as going up against a guardian with a single puny laser is bad news. Before you reach the end of a level, arm yourself to the teeth with cannons, outriders and lasers, and recharge your shields to the maximum level.

▲ *Wasting this alien shouldn't be much of a problem....*

▲ *Oi! What's going on here then?.....*

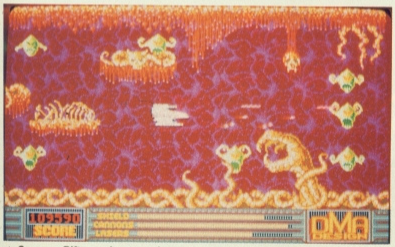
▲ *Arms spinning rapidly, these aliens are no push over.*



▲ *This poor chap hasn't eaten for days – and you're on the menu!*

▲ *An end of level confrontation; it's you or him...*

▲ *The confrontation ends as explosions rip through the guardian's superstructure*



▲ *Carnage Rift – a pleasant place to spend your holiday.*

▲ *Attack of the Mutant Tadpoles*

▲ *Cannons and Lasers are both out as you come up against more opposition*

CONCLUSION

Menace will have you hooked for hours on end. The addictive 'just one more game' feeling hits you every tim e The mixture of arcade quality graphics, sound and gameplay make this one hot shoot 'em up. While Menace does nothing to promote intergalactic peace, the shear satisfaction of wasting aliens this ugly is just too good to miss. In all, a recommended dose of pure arcade violence - just what the doctor orderd

Jason Holborn

GRAPHICS AND SOUND

As you would expect from Psygnosis, *Menace* scores highly in the graphics department. The background and foreground graphics in all six levels are some of the best seen on the Amiga, with the decapitated bodies, rotting flesh and maggot ridden skulls of Carnage Rift being beautifully stomach churning.

The graphics and animation of both your ship and all the Draconian aliens are all up to the same high standard, making *Menace* one of the best presented games available. Even the introduction is impressive as a huge space slug moves smoothly across the screen filling almost the entire play area; a truly impressive demonstration of the Amiga's graphic capabilities. Scrolling too is exceptionally smooth, with not a glitch in sight.

The soundtrack is equally brilliant, with a heavy rock sound track reminiscent of both Xenon and SideWinder. It's nice to find a game soundtrack that suits the mood of the game, something which game designers too often overlook. Playing a jolly little ditty while wiping out a race of aliens doesn't conjure up the right atmosphere. The overall feel of the game is enhanced still further with some excellent sampled speech and sound effects. Feed the sound output into a hi-fi system, turn the volume up and the lights down and the atmosphere is electric.

still graphics
0 1 2 3 4 5

moving graphics
0 1 2 3 4 5

soundtrack
0 1 2 3 4 5

lasting interest
0 1 2 3 4 5

overall 90%

AMIGA £24.95

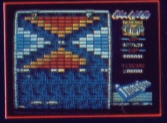
FUEL FOR EN

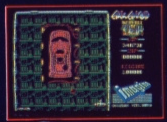
Your plane has ditched on a mountainous plateau somewhere in deepest Tibet. You and your companions are alive. A large shape moves toward you, you rub your eyes in disbelief; a Dinosaur! – where are you ... and when? Stunning, monochromatic 3D graphics and 4 way scrolling, give that '50's cinema mood as you learn not only to survive, but also that your companions are not all they first seemed!

FROM

ocean

One phrase sums up the success and appeal of Arkanoid – "I'll just have another go!" Arkanoid is addictive! Using all the capabilities of the 16 bit micro this conversion is almost an exact replica with all the existence of the original Taito coin-op smash hit. This is Arkanoid – the blockbuster.

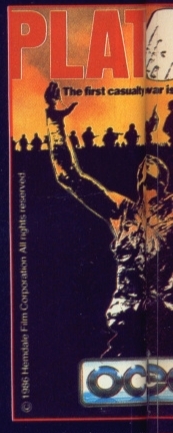




FROM

imagine

the name of the game



Exceptional graphics, innovativ game design and digitised soun all add up to recreate the atmosphere generated in the bi office smash hit. Closely follow the original storyline you take your platoon, selecting individu men for assignment, who will encounter the enemy and ther many booby traps as you seek t find the enemy's underground headquarters. On entering the warren of tunnels you will need flares and a keen eye – your enemy will lunge at you, from beneath the waters which floo the tunnel floor, wielding vicio knives – the atmosphere itself enough to kill!

FROM

16 BIT STATE

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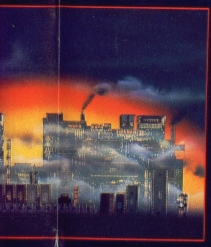

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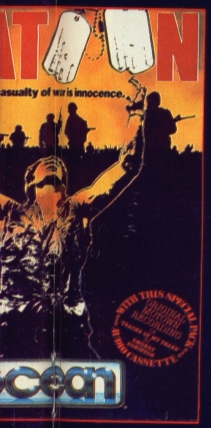
NTERTAINMENT



DALEY IS BACK Enter the 1988 Olympic Challenge with Daley Thompson as you 'work out' in the gym, where your efforts will directly affect your performance in the competition itself – another first from Ocean.

Ten Olympic events include Long Jump, Shotput, High Jump, 100m Sprint, 400m, 110m Hurdles, Discus, Pole Vault, Javelin and 1500m. You will need all your skills to build on what you hope was, an impressive work-out, and, as is necessary for all top flight athletes, your judgement to select the most effective equipment for each event is now vital – a decision which can win or lose you a place on the podium.

This isn't just another sports simulation, this is a Daley Thompson 'event' where all his talent and humour burst through to make a thrilling and enter taining game play for all the family. Go for the Olympic Challenge!

FROM ocean

OF THE ART

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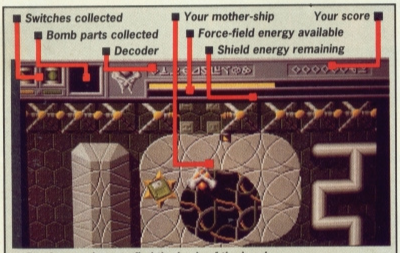
REVIEW

FUSION

BULLFROG PRODUCTIONS/ELECTRONIC ARTS

Amiga – £24.95. Joystick only. | **ST – Due early 1989.**

Although *Powerdrome* was supposed to precede it, recent delays have meant that *Fusion* surfaces as E.A.'s first release developed entirely by U.K. artists. And the team that brought you *Enlightenment – Druid II* have brought with them much of the look of that game. However there's not a magician in sight here – we're talking serious annihilation as you try and construct and then detonate a bomb.



■ *Bomb every base to find the basis of the bomb*

■ *Some of the fabulous scenery you may encounter*

GAMEPLAY

You begin Fusion in an Assault Crawler, a slow moving ground vehicle which you direct along the causeways of a richly textured landscape on a search for your mother-ship, which is concealed by a cloaking device. This brings you face to face with the five types of enemy hiding beneath silos and bunkers; blue rotating plasmo spheres, grey cruise missiles, orange-eyed nitro mice, purple ergonomic disrupters and blue-edged hovering saucers emerge to work in unison against you.

Once you're in its immediate vicinity your mother-ship materialises and you're able to board it. The aim is locate the nine disparate parts of a bomb distributed among the thirteen alien levels, collect and return them to the first level for construction.

Finding the parts is one thing – actually collecting them is quite another. There are a number of different coloured switches which when activated allow access to grid areas and other levels otherwise protected by force-fields and spheroids. To collect a key you must land your ship near it on a piece of open flat ground – a feature hard to find near anything useful – and leave the ship in your crawler to pick the key up. To make matters worse, some keys are located in areas protected by other switches so the puzzle element of the game involves determining the correct sequence of switches to activate.

To help you out in the face of prolonged physical assault are special feature icons which will provide you with bonuses such as extra shield energy, increased firepower and defensive force-field. There are also 'Save Game' icons to be found, usually next to inter-level exits where you may resume a game at a future date.

GRAPHICS AND SOUND

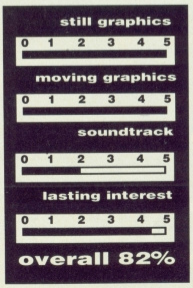
Despite an action window only a little over half the height of the screen, and uneven parallax scrolling, Fusion's graphics are nevertheless finely crafted and feature probably the best contoured landscapes you'll see. Each level is a mix of elevations and plains through which you can glimpse slower scrolling pools of latticed colour threads. Throw in the sleekly animated enemy sprites and you have a rich variety of terrains composed with great care and attention to detail. Full eight way movement completes a very pretty picture.

Sound is confined to an ever-present background score, which tends to detract from the graphics at hand, and the usual kind of spot effects of lasers and explosions.

■ *You find your way to another level requires the key to this switch*

CONCLUSION

Insidiously addictive, Fusion delivers a finely weighted mix of arcade and strategy elements combining to present a series of logical puzzles. Add this to the great graphics on show and you have a game deserving to be bought. Let's hope it doesn't bomb.



POW

ACTIONWARE/US ACTION

Amiga – £29.95, Mouse, Optional Light Gun

ST – £29.95, version imminent

"Every red blooded American is sickened by our enemy's injustice toward our men who gave their lives for their country. Many of our boys are still over there and you're going in to get them out". Three guesses where POW was originally developed? You got it. Thankfully, hiding under the propaganda is one of the best *Operation Wolf*-type games yet to appear on either the Amiga or ST.

This is the first of a set of Actionware games which lets you use a special light gun instead of the mouse, for added venom in combat.

■ *20 miles? Through this jungle? Count me out, Sarge – breaking through the enemy lines you've got a few problems.*

HISTORY CORNER

Officially, the last American combat soldiers pulled out of Vietnam in 1975 when the capital, Saigon, finally fell to the overwhelming Communist forces.

Contrary to the official view, many Americans still believe that some soldiers are being held captive in Vietnam. This sets the scene for POW, and of course Rambo, where Sylvester Stallone proved that you don't need to be able to act to make a lot of money.

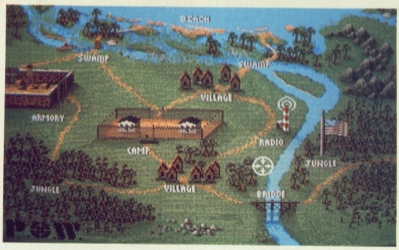
GAMEPLAY

You, the hero, are part of a parachute team landing in the darkest jungle, from where you set about waging war upon the entire army of Vietnam all for peace, justice and the American way.

Each mission takes you through a variety of different backdrops ranging from the jungle to the enemy encampment, to rescue your compatriots, and finally onto the beach to make your escape. It isn't going to be easy, as Charlie throws everything at you in an attempt to bring about your rapid demise. As soldiers pop in from the side of the screen, you have to get them in the mouse-controlled crosshairs for rapid despatch.

First Aid kits and spare ammo cases fall to the ground at various times – shoot them to collect their benefit. If you run out of bullets, it's mission over.

For an extra £49.95, a light gun is available for use with POW. This replaces the mouse and would definitely add to the realism – unfortunately we didn't get one with the review copy, so can't say how reliable it is.



■ *In the village and not a single peasant to victimise. Rambo eat your heart out.*

GRAPHICS AND SOUND

It's not only in the gameplay that the similarities between POW and Operation Wolf are apparent. In the graphics department too, the parallels are unmistakable. Each backdrop is beautifully drawn and very detailed, with many in-jokes – watch out for the banjo-playing swamp beastie!

The enemy has a definite South American look, rather than Vietnamese, which in the light of recent U.S. foreign policy makes you feel as though you're holidaying in Nicaragua.

Animation within POW is well designed and fast – almost too fast as all too often you find yourself overwhelmed by an ever increasing number of enemy soldiers and tanks.

POW has a rather dull music score that does no justice whatsoever to the rest of the game's sound. The rattle of enemy machine guns and the last screams of a dying soldier are all high quality digitised spot effects.

■ *You've still a long way to go before you reach the beaches and eventual safety.*

■ *Talk about sitting targets... it's a good thing you're there to cover your misguided comrade as he climbs slowly up the communications tower.*

■ *They don't give up easy, these gooks. Enemy fire continues frantically to the very end.*

CONCLUSION

Several *Operation Wolf* clones already exist, but none as well put together and as playable as POW. It looks like Ocean are going to have to produce something very special indeed with the official coin-op conversion if they are to put POW in the shade.

still graphics 0 1 2 3 4 5

moving graphics 0 1 2 3 4 5

soundtrack 0 1 2 3 4 5

lasting interest 0 1 2 3 4 5

overall 84%

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GAME BUSTERS

When the heat's right on and your life looks a mess; when your face turns blue and you can't take the stress; where ya gonna go? Gamebusters! More insider dealings than the board of Guinness.

STREET FIGHTER
■ Amiga

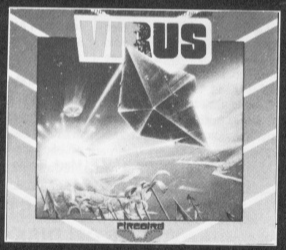
Tips for duffing up opponents:
Japan – Retsu: keep kicking him in the ankle.
Japan – Geki: jump high to avoid darts and kick him in the ankle when possible.
USA – Joe: keep kicking him in the ankle.
USA – Mike: kick him in the ankle until he crouches down to punch you. Jump high before he punches you and then kick him in the face.
England – Birdie and Eagle: stay low and wait for them to approach. Kick them in the ankle to dispose of them.
China – Lee and Gen: ankle-high kicks for these guys.
Thailand – Adon: ankle job once again.
Thailand – Sagat: watch out for fireballs and the opponent's long reach. Jump high, kick and retreat. Repeat procedures.

Paul Ng
Swindon, Wiltshire

VIRUS
■ ST

Hover close to the ground or sea and wait until you see shots from the ship above. Move out of the way at the last instant by making a 180 degree turn. The ship above will either plunge into the dirt or pull a sharp 180 degree turn; if it gets out of the dive, you will lie above it and be able to fill it full of holes.

Seeders have guard drones. Shooting a seeder causes a drone to mutate (double). To avoid getting more than four angry drones, shoot two seeders and then take out the mutants. Stick to these tactics and you'll live longer.



Never approach bombers from behind; either send a missile after them at the first opportunity or glide in front of them and shoot.

Pests fly in figures of eight. Grind to a halt when approaching them and you'll be able to predict their flightpath making it easy to knock them out of the sky.

Jason Pullen
Carlton, Nottingham

Hold down the [Enter] key (keypad) while pressing [P] – you will enter the pause mode. Still holding [Enter], press the [O] key (this gets you out of the pause mode). You will now see a red bar underneath your altitude meter. This tells you you've entered cheat mode, where the following keys might help you:

C Turn special effects on/off
L Adds one missile and one hoverplane
F Restores fuel to full
D Turns demo on/off
N Turns cheat mode off

Anthony Cambray
Margate, Kent

SLAP FIGHT
■ ST

Get onto the second section without firing a shot and you will be given 150,000 points. You will also be positioned just after the first brain cell and awarded two extra ships. You must, however, accomplish this with your first life.

(No name supplied)

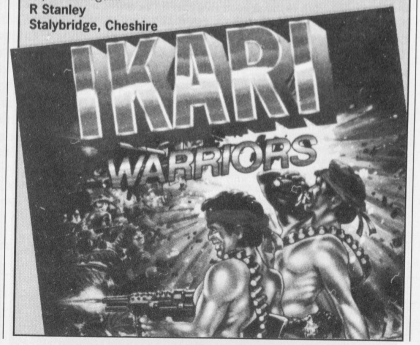
IKARI WARRIORS
■ ST

Tank Tactics – enter the tank as soon as possible and crash into the first building you come across. Press F1 and admire the "Game Over" message. Restart the game; tanks are invincible from now on.

David Woods
Cumbran, Gwent

Pressing the space bar during the game lets your character move into the foliage on either side of the screen. This feature is particularly useful when you're faced with hordes of stampeding troops. The space bar also locks the tank barrel into a set position until the key is pressed again.

R Stanley
Stalybridge, Cheshire



WARHAWK
■ ST

Press F3 once the game has loaded. Then shoot the blue blob during the game. Infinite power is yours!

Niels Gudegast
Stockport, Cheshire

BACKLASH
■ ST

To get a high score move the enemy ports close together and keep your guns blazing in the direction of the port holes. Anything that dares come out will be blasted. There are two ports; these can be bunched together by approaching one of them from the side and pushing it until both are side by side.

Niels Gudegast
Stockport, Cheshire

TRAILBLAZER
■ ST

While the game loads press the keys [Help] 1 1 2 (that's a letter eye-then a digit one) in that order and then type in CHEAT. During the game you can press [F3] to remove gravity, [F5] to change the shape of the ball, [F6] to change player two's ball and [Help] to hear the digitised laugh.

Paul Warner
Eltham, London

WIZBALL
■ Amiga

Pause the game (space bar) and type RAINBOW. Resume the game and press the pause key again. Now hit [C] to fill the pot with the current colour.

Mark Bowles
Ashford, Middx

PANDORA
■ ST and Amiga

To complete the game follow these instructions. Use Lt Commander's ID to open Commander's room. When in Commander's room pick up blue code, scarlet code and Commander's ID. use Lt Commander's ID to leave room. Use Commander's ID to open Captain's room. Pick up SDI disk and use Commander's ID to leave room. Go to Engineer's room and pick up sonicdriver and Engineer's ID.

Get a weapon and kill squash player. Pick up electroboost. Fight Ice Lord with sonicdriver and then follow corridor above him. Hold Engineer's ID and enter passage halfway up the corridor. Dodge the droid and get to the AWOL officer's body. Pick up his ID and put it in your pocket. Give electroboost to robomechanic and he will give you the ochre code.

Find main computer and insert SDI disk and then the codes in the following order: ochre, scarlet, blue. When self destruct is initiated use Engineer's ID to leave control room. When you are back in the corridor hold AWOL officer's ID. Go to the escape pod (located close to the place where you were beamed aboard) and walk through the force field. You're out.

Jonathan Atha
Sheffield

THIS MONTH'S WINNERS:

Edward Penman for his fantastic ST Dungeon Master cheat routine. He gets a special prize of £60.

Peter Featherstone gains a gaggle of glorious Amiga games for his superb Ice Palace and Ikari Warriors hacks.

Anthony Cambray wins some super ST software for his vivacious Virus tips.

GIANA SISTERS
■ Amiga

Pressing all the keys that make up the word ARMIN during the game will allow you to skip levels.

Mark Bowles

THE GREATEST GAMES WAITING TO BE GRABBED

Tips, pokes and game-busting ploys. Yes, we want the lot. If you've discovered a secret password, written a poke, mapped a game, completed an adventure, found ways of getting high scores or know of any underhand method that lets you win, then send us details. Doing so could win you a collection of the best new games for your machine, ST or Amiga.

Interested? Well stop gawping. Get your game busters to us. Send them to Gamebusters, ST/Amiga Format, 4 Queen Street, Bath, BA1 1EJ. Please state whether tips are for ST or Amiga. Try and make tips short and snappy – we want to know how to complete the game, not a catalogue of all known Capybara's south of Penge. Pokes can be any length as they will be included on the cover disk rather than printed. If a poke is very long, please send it on a 3.5" disk. Enclose a jiffy bag and return postage if you want it back.

We have had so much good stuff that we've had to hold a lot of it back. Don't worry, it will appear eventually. Keep sending in those crackers.

AMIGA POKES ON DISK

Peter Featherstone, pokester supreme on the 8-bit CPC scene, has directed his talents towards hacking Amiga games. And, boy, has he chosen a couple of goodies to demonstrate his skills.

The two Elite titles, Ikari Warriors and Beyond the Ice Palace, have been give a thorough thrashing. Infinite lives, ammo, grenades and fuel will definitely give you the edge in Ikari Warriors. While the infinite lives provided for Ice Palace should make the game easier to complete.

Double click on the drawer labelled Gamebusters. Inside you will find three files: CHEAT.DOC, IKARI.CHEAT, ICEPALACE.CHEAT. Double click on CHEAT.DOC to read the documentation file. After that double click on either of the game-poke files. A short pause later and a message will appear asking you to insert one of the original game disks. Follow the prompts from there.

No need to make a backup of either disk as the pokes don't write directly to disk.

ST DUNGEON MASTER CHEAT ON DISK

The ultimate Dungeon Master cheat routine! Guaranteed you have never seen a cheat this slick before. Edward Penman has slaved over a sizzling keyboard to bring you over 40k of program that will hack Dungeon Master beyond your wildest dreams. Just look what it offers:

- ***Alter the map at will to create short cuts, new passages and so on.***
- ***Fix the game so that doors will open without the need for keys.***
- ***Remove secret doors.***
- ***Print out plans of all fourteen levels in the Dungeon.***

Insert the Cover Disk into drive A, double click on the drive A icon, double click on the POKES folder when the root directory window appears and finally double click on the DMCHEAT.DOC icon. Once you've read the documentation (by clicking on SHOW), double click on DMCHEAT.PRG.

Ed's program will run in any resolution, although the higher the better. It works by altering a saved game file so it doesn't affect the original Dungeon Master disk. However, read the help file present on the disk before attempting to alter a saved-game file – you may ruin the saved data and lose your position.

The first two levels can be tuned to your taste. Maps of each level can be portrayed on screen and altered. Parts of the map can be turned into either corriors or walls, or even blanked out completely (this last method is a little drastic and can cause problems). It is almost worth buying Dungeon Master just to use Ed's routine.

QUALSOFT

SPORTS STRATEGY

CODA

FOOTBALL MANAGEMENT GAMES THE ST DESERVES

Football management games, both Soccer and American Football, have the potential to produce excellent strategy games of some considerable sophistication. QUALSOFT produced League Division One in 1983, and Mexico 86 in 1985, but otherwise the implementation has been infantile. When Coda sent me HEADCOACH for the BBC Micro, 2 years ago, I saw an American Football computer game for the first time that measured up to the same standards. QUALSOFT is pleased to offer Atari ST users "World of Soccer" and "Head Coach v3", two games I honestly believe will fill a yawning gap for those looking for realistic simulations of the real games.

Malcolm Howard, QUALSOFT

WORLD OF SOCCER

International management is the ultimate challenge in soccer. To build a squad of players to defeat the ball playing skills of Brazil, the fluid play of Holland, the organisation of West Germany, the counter-attacking of Italy, and the many varied styles of many others, demands an insight into the game rare amongst managers let alone fans. Do you exploit a team's weaknesses, or play to your own strengths? Do you attack down the flank with wingers, or pierce the centre with powerful midfield running? Do you play a flat back four, or use a sweeper or libero?

In "World of Soccer", players are not just attackers/defenders/midfield but goal poachers, play makers, ball winners, wingers, left, right and centre backs, sweepers (19 types of player in all). The results of matches are determined by simulated soccer matches controlled by the skills of the opposing players. Strategy is determined by the skills you build into your squad, and tactics by the particular skills you use to defeat particular teams. Substitutions and tactical moves can be made during the match to change or reinforce your plans.

For four years, through the Qualifying and Final stages of the European Championship and the World Cup, you will guide the European team of your choice. You can prepare for the competitions with friendly matches of your choosing, developing your strategy to match the in-form players at your disposal. Success is there for the taking, but it will need earning.

Choose from 33 European squads. The 4 UK home countries have 16 man squads which can be increased to 36 with players of your own. A customisation program will allow squads for any of the 33 countries to be created.

HEAD COACH v3

On the field 220lb blocks of concrete-on-legs collide, while a small man in a suit paces the touchline stroking his chin. He's the Head Coach. He has more tactical skill in his little finger than the MCC can muster in the entire club. Third down and 9, he signals to his quarterback. The quarterback takes the snap back into the packet, dummies to his star running back, wheels to the right skirting two defenders, motions to throw to his rightside wide receiver and then swings his pass back over the pack to his open Tight End. He catches and makes another five yards before being grounded. An eleven yard gain and another first down, thanks to 2 hours of rehearsal the previous Thursday afternoon. The crowd cheer the quarterback but the head coach knows that his Right Guard really deserves the credit. This is American Football, Chess with mobile human pieces.

It's your first season as a Head Coach in the NFL and you face two pre-season games. You must give as many of your 45 players a run out to see how they've come through the close season. Through these matches and the time spent at training camp you must devise your game plan to face your first NFL game. Over the next 16 games you will meet the likes of the Chicago Bears, the Washington Redskins, the Dallas Cowboys, the LA Raiders (hiss). Each game will need a new plan to exploit the weaknesses and nullify the strengths of such teams, and in the game you will probe their defense and try to stifle their offense. Success over these 16 matches will put you into the playoffs and in sight of the Superbowl. Failure will give you the best of the college draft, which will allow you to make up for the deficiencies you must by now have discovered in your side. Providing of course that the club keeps you on . . .

Let us be straight , Head coach v3 is NOT an arcade game. It's a sophisticated game based on American Football. For those who already understand something about the game, it's a chance to find out just how much they really know. For those to whom the game appeals but is something of a mystery, then Head Coach v3 is the ideal way to find out what the game is all about. In the match itself, you have a choice of 27 offensive plays and 21 defensive plays, and so you can bias your plays to suit the skills of your squad and negate those of the opposition. The training camp will give you an insight into the current performance of your players, even checking their speed in 40 yard sprints. There's only one thing that can prevent your team from eventually achieving a Superbowl place; YOU! But we warn you, this game is ADDICTIVE.

"World of Soccer" and "Head Coach v3" are available from QUALSOFT at £17.50 and £19.95 respectively.

Tel: 0438 721936 Dept. STAM 18 Hazlemere Road Stevenage SG2 8RX	Please supply: World of Soccer ❐ £17.50 Head Coach v3 ❐ £19.95	Name: _____ Address: _____ _____ Access No. (if applicable) _____

POWERPLAY

ARCANA

Amiga – £19.95, Joystick, mouse

ST – £19.95, under development

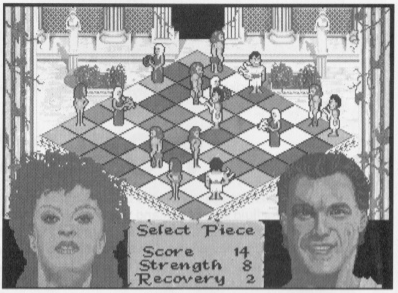
Powerplay is a version of the traditional pub quiz machine, with more than a passing reference to Role Playing Games. Up to four players choose teams from Greek mythology with which to engage in a contest of knowledge. Play is based on a chequerboard of coloured squares, which we are reliably informed is in a courtyard in the Temple of Apollo.

Each square represents an area of knowledge – general, leisure, science or history/geography. Correctly answering a question allows you to move a selected character to an adjacent square; the objective being to eliminate your opponents' pieces from the courtyard by landing on their squares and engaging in a challenge.

A challenge, since you ask, consists of the two players competing against each other to answer questions; the first player to gain a three question advantage wins and the loser's piece is removed. As a strength factor is added to a character each time a question is correctly answered it becomes a question of manoeuvring your strongest pieces to take on challenges.

When playing the computer, the reaction time you are allowed as the game progresses gets shorter and shorter. Things become almost pointlessly difficult when you barely have time to read the question before you are timed out.

Graphically ,Powerplay doesn't make anything like an interesting use of the Amiga's capabilities. Despite animated movement throughout, the sprites aren't really well designed or defined. With Greek Gods bopping up and down it looks more like a scene from the local nightclub. Sound-wise, the game features spot effects providing atmosphere for the animated challenge sequences.



■ *Trivial Pursuit was never like this...*

Although not delivering either graphical power or compulsive gameplay, Powerplay is certainly a novel approach to the current Trivial Pursuit/pub quiz fad. If Arcana were to bring out new data sets from time to time they might be on to a winner.

still graphics 2.0
moving graphics 2.0
soundtrack 2.5
lasting interest 4.5
overall 55%

LUXOR

PARADOX/SOFTWARE HORIZONS

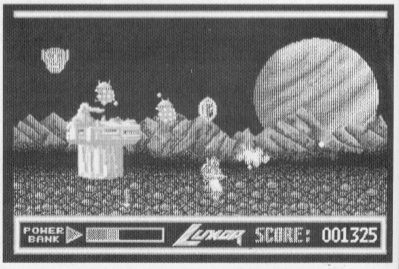
ST – £14.95. Joystick only. Reviewed.

Amiga – £14.95, Due end October.

Luxor might sound like the name of an entry for the Eurovision Song Contest and with the avowed objective being to rescue the beautiful Diora it could just be a romantic game. In fact, it is a good old shoot-em-up, requiring an un-remitting forefinger on your fire button.

The aliens range from flying saucers to miniature R2D2s and there's even an ugly hovering creature with a face like an armadillo thrown in for good measure. Luxor has three levels and a great end sequence. It begins with a spaceship (which looks like some creation out of Blue Peter) hatching you onto the plains of the evil Okira Empire. From here on in you shoot everything in sight except the revolving P's and B's. When you collect a fuel tank you can take a trip onto the next level or planet and get ever nearer to your beloved Diora.

An unusual feature of this game is the apparition of a fairy. You are supposed to gently catch her whereupon she will grant you one wish, but with all guns blazing you usually end up blasting her to hell. She's an ugly looking creature so she probably originated from there in the first place. Chasing fairies in a shoot-em-up certainly makes a change from the usual destroy-the-universe scenario. Will it catch on?



■ *Watch the Okira warriors disappear in a puff of orange smoke and wait for the fairy to appear.*

The graphics routines look almost 3D, but your astronaut seems to be leaping around in a 2D plain. Luxor's digitised sound track resembles the old 8-bit games – with the volume turned up and your ear next to the speaker you can just about make out the words 'Get Ready'. If Diora looks anything like the fairy then you probably won't want to!

Mark Higham

still graphics 4.0
moving graphics 3.0
soundtrack 2.0
lasting interest 2.0
overall 60%

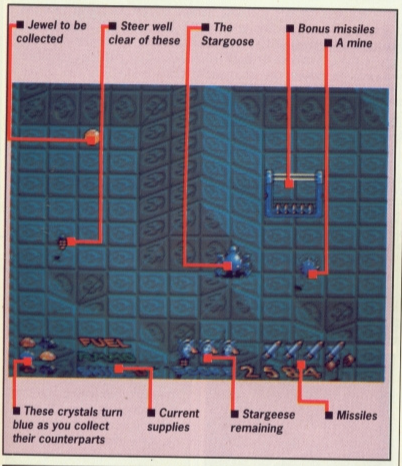
STARGOOSE

LOGOTRON

ST – £19.95. Mouse,joystick.

Amiga – £19.95. Version imminent.

A vertical scroller in the Goldrunner/ Xenon vein will always attract serious attention from the confirmed shoot-em-uppers amongst you, and when the blast-out features the addition of contoured landscapes from messrs Cain and Everett, the Boys who brought you Black Lamp, you'll be tempted to buy with only a passing glance at reviews. But geese in space? Whatever next?



GAMEPLAY

The task ahead of you as commander of a Stargoose hover-ship is quite straightforward – you have to negotiate eight looped levels of heavily defended surfaces, and find and collect six crystals in each. Control is best achieved with the joystick – the mouse option is decidely unresponsive – and movement consists solely of side-to-side movement. Missiles are of more use than line-of-sight lasers in tight situations as they skim the contoured surface like cruise missiles rather than just taking a mountain out. Loading and firing the missiles is a little awkward, however, requiring presses of the [Alt] and [Caps] keys.

The opposition consists of fixed laser/bomb turret installations and moving attack vehicles whose shots gradually deplete your shield levels. As the levels progress you find yourself having to go faster and faster, but the more experienced among you won't find the challenge too daunting.

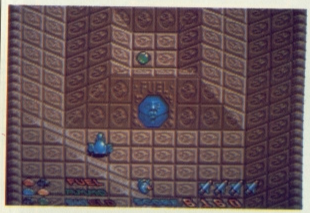
Ammo, fuel and missiles will all need replenishing and this is achieved by manoeuvring your craft through the open mouths of portals. You then find yourself in a wire-frame tunnel full of large blue eyes which you must steer into to top up your supplies. Curious eh?

Although there is no save game option, Stargoose will restart on the level you last achieved. Restarting on, say, level 4 will take you back to the speed of level 1 so you can take it at a more manageable pace.

GRAPHICS AND SOUND

Logotron describe Stargoose as featuring 'Full-Beef Scroll' – a curious little term denoting a full use of screen width and height with superimposed status information. The look they're after is coin-op arcade – no fancy screen surround to make up for a reduced play area – just full-beef scroll with variable speed. Wild concept, guys!

But it's the relief surfaces which make the game unique. Each level has mapped contours of increasing complexity accompanied by cycling colour shifts. Although at slower speeds the surfaces are solid enough to scroll smoothly they do tend to begin to strobe as speed increases in later levels. It's a pity also that whilst the mapping of surfaces changes from level to level the design doesn't significantly alter as, say, in the other recent Logotron release, *StarRay*. Along with a repetitive music track and unimpressive spot sound effects this detracts from what could have been a game you'd return to again and again.



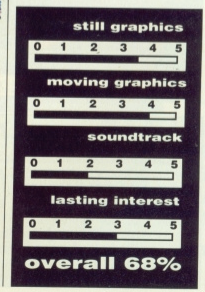
Have a gander at those saucy surfaces. You take out a couple of mines and make your way to the fuel portal

Life as an intergalactic goose can get quite hairy!

You curve your way through a tunnel to collect as many eyes as possible

CONCLUSION

Stargoose scores in its use of relief-mapped surfaces and an original method of restocking supplies but fails to deliver enough variety in gameplay to qualify as a classic. If it's well-executed minimalism you're after then Stargoose delivers; otherwise there's been no golden eggs hatched here.



REVIEW

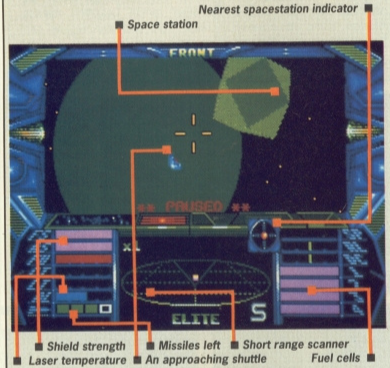
ELITE

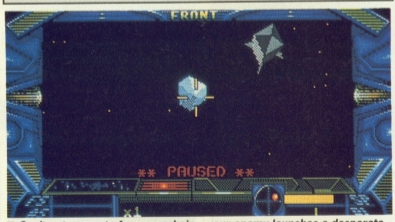
MR. MICRO/FIREBIRD

ST – £24.95. Joystick,mouse. | **Amiga – £24.95. Under development.**

Is there anyone out there who hasn't played Elite? David Braben and Ian Bell's classic finally makes it to the ST and picks up solid 3D colour graphics on the way. Five years ago this game revolutionised the concept of computer gaming in so far as it provided scale, depth and open-endedness in a compulsive mix of intergalactic trade and combat guaranteed to totally absorb. And all that in 32K. So how well has it converted?

■ *You're about to dock at the orbiting space station...*





■ *Can't get you out of my crosshair... your enemy launches a desperate last salvo (upper right).*

GAMEPLAY

Alongside Firebird's soon-to-be-released *Frontier* and Gremlin's *Federation of Free Traders* (reviewed last month), Elite's 2,000 planetary systems strung across 8 galaxies might seem a little confined – but how much space do you need? Elite offers two styles of gameplay which should satisfy aficionados of both arcade and strategy games.

You start off with your ship docked just off the planet Lave, an arsenal of three missiles and a pulse laser, fuel for a hyperspace jump of 7 lightyears, 100 credits and a rating as Harmless. At this point you can choose to stock up on various commodities for future trading. By playing the intergalactic stock market you can accrue sufficient credits to stock up on 14 types of hardware and armaments – galactic hyperdrives, military lasers, fuel scoops and escape capsules among them. Docking computers might be your best buy though as attempting to dock with a revolving dodecahedral space station involves manual dexterity that wouldn't go amiss at NASA. Then you knuckle down to some raw aggression and commence the long climb through the ranks of Mostly Harmless, Poor, Average, Above Average, Competent, Dangerous, Deadly and, ultimately, Elite.

If this wasn't enough, there a number of different types of aggressive strategy you can adopt as an alternative to the rather mundane career of trading. You can go bounty hunting for pirates, or become a renegade pirate yourself, go asteroid mining or merely engage in illegal trading of firearms, narcotics and slaves. For years if you so wish. Randomisers in gameplay mean no two games will be the same. Good job there's a save option then, isn't it?

■ *Getting the low down on the planet you're about to pillage*

■ *At the stores: play the intergalactic stockmarket, trading in any of the items pictured.*

CONCLUSION

You can't help feeling a sense of nostalgia as Elite boots up and you scan the galaxy for the best deal to be had. If you've never played it before then it's worth buying just to find out what you've been missing all these years. Otherwise it's time to move on. Watch out for Elite 2 though – any bets it appears on the Archimedes first?

GRAPHICS AND SOUND

ST Elite has screens of 16 colours which, for the old hands amongst you (read 'purists'), might be akin to colourising an old Chaplin film. Whilst the mainly mono versions provided a certain atmosphere, it's no surprise the addition of colour comes over as a touch gaudy. But then the solid 3D graphics more than make up for this. There's now a realism which no amount of wire-frames could provide. Movement is smooth enough but we're not talking state of the art solid velocities here – we're talking about a game which is five years old, and in this business may as well be five decades. What you've got is a faithful rendition of a classic with solid colour and a few extra missions – no radical overhauls here – the sound department is distinctly on the two-bit side of eight-bit.

still graphics 0 1 2 3 4 5

moving graphics 0 1 2 3 4 5

soundtrack 0 1 2 3 4 5

lasting interest 0 1 2 3 4 5

overall 75%

Always Reasonable Reliable And No Fuss

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REVIEW

VETERAN

SOFTWARE HORIZONS

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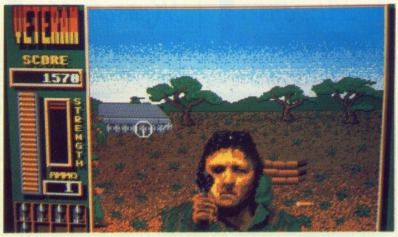


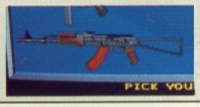
■ *If it moves kill it. If it's gold, pick it up for extra ammo and rockets*

First off the line for Software Horizons' Yugoslavian products, *Veteran* is an *Operation Wolf* clone which attempts to catch the deadly realism of a commando going about his everyday business. Given the country of origin, at least your foes aren't the poor, beleaguered commies this time.

The three levels of battle feature enemy soldiers, personnel carriers, tanks, choppers and gun emplacements, all trying their best to cut you down. It's up to you to level them and pick up the extra ammo and rocket launchers they leave behind. You start the game by choosing between four automatic rifles – a Mauser, Heckler and Koch, Kalashnikov and last, but by no means least, the 1100 or so rounds a minute of an Ingrams M-10. It's then a simple task of moving the mouse to target the victim with cross hairs and fire or launch a rocket. The game ends when you take out the enemy's HQ on level three.

Animation and sound is reasonable, though men and machines do tend to jerk their way onto the battlefield under a cover of digitised fire and explosions – but the highlight is undoubtedly the chunky close-ups of a soldier in his death throes. Hardly for the squeamish, but then if you buy this you're probably a veteran of more simulated armed combat than your average GI and won't find constant carnage a problem.

Hats off to Horizons for coming in at under £15 but then at a higher price *Veteran* wouldn't be worth an outing. Even now it's pushing it's luck a bit – it needs more levels, more varied action and a much faster load time between levels.



■ *Choose your hardware – whether it's the deadly Ingram or the equally lethal Soviet Kalashnikov, you can be sure that you're in store for some seriously unsociable behaviour.*

still graphics 3.0
moving graphics 3.0
soundtrack 4.0
lasting interest 2.0
overall 60%

OPERATION NEPTUNE

INFOGRAMES

Amiga – £24.95. Joystick only. Reviewed

ST – £24.95. Joystick only. Imminent

■ *What do you call a couple of Frenchmen wearing flippers?*

Infogrames' second game, after *Hostages*, couldn't be more different from the first. Set at something approaching twenty thousand leagues under the Pacific, *Operation Neptune* is a sub-aquatic seek-and-destroy shoot-em-up involving four distinct missions. You begin by being dropped with your jet scooter to the ocean waves where you have to fend off enemy riders with your feet before your sub surfaces and takes you on board. Once aboard, a small screen shows you the ocean floor and you can scroll a map showing the local environs. Here you will find the location of your sides' bases which you can use to refuel oxygen and power and identify enemy positions. By clicking on a chosen destination you are transported through the remarkably clear and well-lit depths taking care to dodge or blast your way past various obstacles. Mines are one of the hidden dangers here.

On your way, you may also be alerted to two other kinds of combat. An inset appears showing your despatch to an airlock. Once on swim-about you either find yourself in flippered fisticuffs with enemy frogmen, scanners, sharks and octopi or dodging high-speed underwater jet-subs firing charges your way. In both instances, aggressive use of the joystick normally consigns all assailants to Davey Jones' Locker. By the time you make it to an enemy base you'll have no compunction about feeding those guys to the fish.

Operation Neptune is a little disappointing in the graphics department. The submarine view screen is pretty small, the underwater scenery pretty repetitive and the exterior shots pretty weedy. Conversely, sound is more than okay when it comes to atmospherics but the background music is a bit over-melodramatic.

Being underwater rather than in outer space makes Neptune an interestingly designed game, but it's let down by a lack of breadth. There's simply not enough here to engross you time after time. Still, plenty more fish in the sea...

still graphics 4.0
moving graphics 4.0
soundtrack 3.5
lasting interest 2.5
overall 70%

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REVIEW

SUPER HANG-ON

ELECTRIC DREAMS/MEDIAGENIC

Atari ST – £19.99, joystick,mouse

Amiga – due January '89

It's quite a change to do a spot of road running without a huge arsenal of weapons on the end of the fire button – overtaking the guy in front is an awful lot harder if you can't blast him off the track. *Super Hang-On* compensates by putting a nitro charger at your finger tips. If you're doing over 200km/hr, you can cut in the charger, bump up the speedo to around 325 and hold on for dear life as you burn off everything in sight. Whether you'll make it around the next bend is a different question entirely, but thankfully there are 48 stages of difficulty coded down to a tee. If two-wheeled terror is your kind of kick then this should be on your list. It's more exciting than *Outrun*IF, but is that really saying anything?

Super Hang-On is a race against time set on four continents, each featuring colourful backdrops of deserts, fields and cities. Finish a stage in the allotted time and its onto the next stretch of speedway. You won't have much time to admire the scenery though as there are rocks, trees and lamp post festooning the roadside and a bunch of other leathered loonies to drive you nuts. Indeed, collisions with other bikes are the fastest way to get a face full of gravel so your reactions are more likely to be concerned with their cornering abilities than your own. You'll need to keep pumping that nitro though as some of those stages are very tight on time. Mouse control is more responsive than joystick for those moments that really matter.

Animation is fast and solid and collisions depicted by the kind of acrobatics that would leave you racing in a wheelchair (*Bath chair? – Ed*) for the rest of your days. There's a choice of four accompanying sound tracks which are best consigned to the background forever by hitting space.

Super Hang-On is a great conversion of the Sega classic and proves yet again that the gap between coin-op and 16-bit is narrowing all the time.

■ *Pull back the throttle for a 200 m.p.h. charge across four continents.*

still graphics 3.5
moving graphics 4.0
soundtrack 2.0
lasting interest 3.5
overall 65%

NETHERWORLD

HEWSON

Amiga – £19.95. Joystick, reviewed.

ST – £19.95. Joystick, also available.

The programmer of this little number delights in the name Jukka Tapanimaki. Great name Jukka, great game too.

So you're in another time, another dimension locked in the eternal fight between good and evil, facing hideous 'death-exuding' aliens of every imaginable description etc etc. This time the evil takes the form of acid bubbles, demon dragons, goat's heads and various mines, as you guide your ship through level after level of mayhem in a search for diamonds. You're up against the clock and searching for a teleport to the next dimension (sounds like working for Format – Ed) as you pump a million tons of lead into dragons' heads. Such noble restraint will give you extra lives, extra points, mystery bonuses and special features like inverting all control movements.

The graphics and sound display their 8-bit lo-res design origins, but scrolling is obviously improved. Certain 'trigger' icons flash you across three screens' worth at something approaching light speed when you run into them.

Possibly Hewson's strongest 16-bit release in terms of sheer blastability, Netherworld really shifts in the firepower department despite a rather standard scenario. A good outing for Hewson on the 16-bit format – now when are they going to get beyond 8-bit conversions?

AMIGA v ST

The Amiga version of Netherworld is significantly better than on the ST. The gameplay is the same, but scrolling is faster and smoother, the sound is more varied, and some clever programming allows more colours to be used on screen. Overall, we'd only rate the ST version at 60%.

■ *You carefully ponder how to get at those gems while gently blasting the living daylights out of this poor beast*

■ *A quick salvo of pure laser power is all this guy understands!*

still graphics 2.5
moving graphics 3.5
soundtrack 2.5
lasting interest 3.5
overall 64%

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DISK EXTRA

ST Amiga Format's unique dual format disk gives you the best of both ST and Amiga worlds! Get stuck into this month's bonanza, including complete playable versions of the classic Space Invaders or Pac Man for your machine.

ST

74 SPOOKS

Oh, the nostalgia. The memories of a misspent youth come flooding back when you try your hand at this version of Pac Man.

75 LIGHT FANTASIA

Sit back, load up your Woodstock double album and get high on this psychedelic light show. This is really heavy stuff, man! Flared trousers and Afghan jacket not supplied.

77 ST SWITCH

Run two programs simultaneously with ST Switch. It's not multitasking, but it can still speed up your work rate considerably.

77 ETERNAL RAMDISK

Most RAM disks die instantly when your ST crashes or is reset. Not Eternal, the ST recoverable RAM disk that just won't die.

77 B BOOT

By popular demand, we present B BOOT, written by your very own technical editor, the ridiculously renowned Richard Monteiro. You can now boot from drive B without having to perform open heart surgery on your ST.

77 DUNGEON MASTER CHEAT

Yes, we know this one didn't make it onto last month's disk, that's why it's on this one. Now you can design your own dungeons with the ultimate dungeon master cheat program.

77 DESK_PIC

Enhance the look of your screen display with this ingenious little program. DESK_PIC loads a 32K picture into the backdrop screen of the ST's desktop.

AMIGA

74 AMOEBA INVADERS

Enjoy the frantic atmosphere of that all-time arcade classic, Space Invaders. Save the Earth (again!) from the ever advancing alien hordes.

75 ICON MAKER

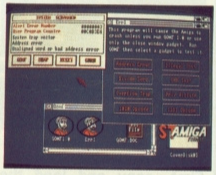
Fed up with the Workbench Icon Editor? Create icons of any size from standard IFF format brush files with Icon Maker.

79 MIDI UTILITY

Whether you're a budding Beethoven or a future Vince Clarke, MIDI Utility will help you with your musical masterpieces – particularly with our DIY MIDI interface kit in this issue.

79 DX VOICE FILER

If you're the proud owner of a Yamaha DX series synthesiser and an Amiga MIDI interface (OK, we won't plug our kit *again*) then DX Voice Filer is for you. Throw away the tape recorder and store your voice files on disk.



79 GOMF 1.0

Stop your machine from going out to lunch with the Guru. GOMF is a program destined to become the Amiga user's guardian angel.

75 NEMESIS DEMO

Brighten up your screen with this neat graphics and music demo. It shows just how good simple effects can be.

79 CHEATS

Get the better of *Ikari Warriors* and *Beyond the Ice Palace* with these nifty little pokes.

AMIGA MIDI SPECIAL!

So you've finally got your Amiga MIDI interface, your synthesiser and a lot of musical ideas just waiting to be unleashed. All that is now required to get you up and runnng is some software, and as it 'appens guv, this month's cover disk has just the programs. Just think, the road to international stardom, all night parties and constant hounding by groupies is finally within your grasp.

WE'RE PAYING £800! FOR GOOD SOFTWARE ON OUR COVER DISK

We're looking for good quality software to fill our cover disk each month. If you're a nifty programmer you could earn big bucks from your labours – games, business applications, utilities, or anything of general interest.

Turn to the end of this section for more details on how to get your software onto the Format cover disk.

DISK

THOSE WERE THE DAYS!

Contrary to popular belief, *Space Invaders* and *Pac Man* weren't the games that launched the arcade craze in the UK. The game that started it all was in fact *Pong* written by a certain Nolan Bushnell, founder of Atari, back in '72. The game didn't appear in the UK until the following year but it laid the foundations for today's prosperous arcade industry. Space Invaders arrived on the scene in 1978 and instantly spawned immitators due to the fact that the creators, Taito, failed to issue any copyright on the game. Pac Man arrived two years later and has since caused many legal wrangles over copyright infringement, including the first major bust up between Atari and Commodore over *Jelly Monsters* on the VIC 20.

ST

First, copy and load the disk as described at the end of the Disk Extra section.

SPOOKS

Public Domain
All Colour STs
FILENAMES: SPOOKS.PRG, PACMAN.DOC

Do you remember the excitement that surrounded the industry a few years back? The arcades were full of games like *Space Invaders*, *Asteroids* and *Pac Man*. Although the graphics and sound produced by those early machines weren't a patch on what the ST and Amiga can now produce, the sheer addictiveness of the gameplay kept gamesters coming back for more. Of all those early games, *Space Invaders* and *Pac Man* proved to be the most popular among game-players. We gave you *Space Invaders* with Issue 1, and now you can complete your collection with *Spooks*, a *Pac Man* clone.

■ *Spooks (ST) - the game that gives a whole new meaning to the phrase 'Pacced Lunch'.* Pac Man *lives again.*

You can load *Spooks* either from our cover disk menu program, CLICK_ME, or by clicking on the game's icon on the Desktop. You need a joystick in control port two to play. Spooks tends to play havoc with the ST's internals and it is therefore advised that you turn off your ST after playing Spooks before attempting to use any other programs. Full playing instructions are included in the Spooks folder.

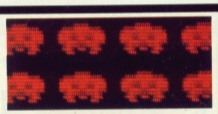
AMIGA

First, copy and load the disk as described at the end of the Disk Extra section. These programs run on all three Amiga models. We have been unable to test them on the early version of the Amiga 1000.

AMEOBA INVADERS

Public Domain
All Amigas
FILENAMES: Ameoba_Invaders, Ameoba_Invaders.DOC

Who hasn't at one time or another played *Space Invaders*? Very few. A few years back, Space Invaders was THE game to be seen playing. Some people would spend hours in front of the console blasting away at invading sprites and pumping 10 pence pieces into the coin slots. Even in the days of more sophisticated arcade machines like *Afterburner* and *Space Harrier*, Space Invaders still continues to entertain the most hardened of arcade junkies. You too can experience the arcade classic with *Ameoba Invaders*.



The workings of Space Invaders must surely be known to almost everyone, but if you genuinely haven't ever played Space Invaders (Where have you been!) then sit yourself down and we'll begin. You are the sole guardian of a peace loving planet that has for many years resisted the aggressive alien race that is hell bent on adding your sweet little planet to its list of alien tourist attractions. Not content with a short, sharp 'No, Go away' as an answer, the aliens take it on themselves to capture your home planet by force. With your mobile laser turret, you are the final obstacle in their path. Fight hard, Space Adventurer, or your planet will be subjected to a hideous fate... intergalactic tourists and alien soap operas.

You can load Ameoba Invaders by clicking on its icon on the Workbench or by inserting the cover disk at the 'Insert Workbench' screen. Full instructions are included in the Ameoba Invaders drawer.

■ *Amoeba Invaders (Amiga). It's so good you'll even believe there are good ol' red, blue and green plastic strips across your screen, in true arcade style.*

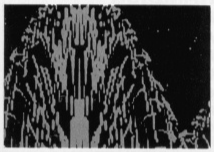
LIGHT FANTASIA

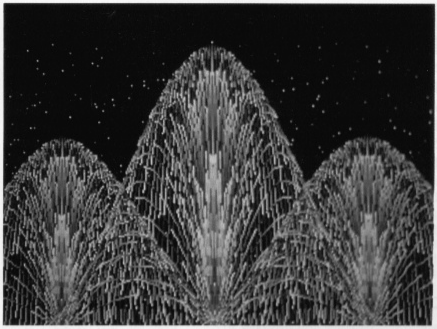
by N. Antonson
All Colour STs
FILENAMES: FANTASIA.PRG, FANTASIA.DOC

Light Fantasia is an interactive light synthesiser similar to those made famous by the llama man, Jeff Minter. While not as sophisticated as Jeff's masterpiece *Trip-a-Tron*, Light Fantasia will provide an insight into the world of light synthesis.

When left to its own devices, Fantasia runs through a preset light show. If you're feeling in the mood, though, and are geared up mentally then it's time to take over the action and create your own kaleidoscope of spectacular, swirling colour.

Playing the keyboard of your ST can produce the final death throes of an exploding galaxy, the cycling brilliance of the fountain of light or the hypnotic power of flying light (*Is this hype or what? – Ed*).





■ ***Light Fantasia in action. Caution – don't run this program if you're in an illegal state of mind!***

Experience Light Fantasia by selecting it from the CLICK_ME menu or by clicking on its icon on the Desktop. After a few seconds Fantasia loads and displays a title screen. Press the space bar and the main program is loaded into memory.

The graphic elements employed in Fantasia are complex and require a fair amount of setting up. This is carried out automatically when the program first loads, but you'll just have to sit back and wait a couple of minutes while it happens.

Full instructions and a list of all Light Fantasia's controls are available within the Fantasia folder.

ICON MAKER

By Richard Biswas
All Amigas
FILENAMES: IconMaker, IconMaker.DOC

Icons on the Amiga have always been the source of much confusion. Only a select few have mastered the art of making icons do exactly what is required. With *Icon Maker*, though, the process of constructing icons suddenly becomes a whole lot easier.

Icon Maker lets you construct icons of any size from standard IFF format brush files as produced by programs such as *Deluxe Paint* and *Aegis Images*. In fact, any paint package that produces IFF format pictures should provide for the saving of brushes. If you don't own an Amiga paint package, the Fish public domain disks are as always a good source of IFF pictures.

Not content with converting IFF brush files to icons, icon maker lets you reverse the process, converting icons to IFF brush files. With a little imagination and artistic flair, your Workbench can take on a whole new appearance.

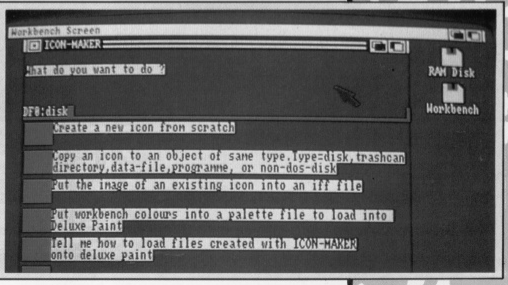
Icon Maker is a fairly 'techie' program, but is designed to be as simple as possible to use. Just a point and a click is all that's required. Full instructions, including a comprehensive tutorial, are included in the Icon Maker drawer. This file is definitely recommended reading if you want to get the most from Icon Maker.

You can load Icon Maker either from our cover disk menu program Click_Me, or by clicking on its icon on the Workbench. If Icon Maker fails to work, check that you have the file ICON.LIBRARY in the LIBS directory of the disk with which you start your Amiga. All Workbench disks have this file as standard so it is best to boot your Amiga with Workbench before using Icon Maker.

NEMESIS

Public Domain
All Amigas
FILENAME: Nemesis

This is a neat little demo submitted by American Mark Riley to last year's 'Badge Killer' contest – a competition to find the best Amiga graphics and sound demonstration. It takes up a mere 60K on disk, which is peanuts for a graphics program, and works in low resolution mode. Apart from being a most relaxing cosmic experience as you swoop round planets and through asteriod belts on a journey through the solar system, it is a fine example if how effective simple effects can be. Watch how colour cycling, shadows and single pixels of light are used to create your very own planetarium, then write your own demo and send it in to us!


Workbench Screen
ICON-MAKER
What do you want to do ?
DF0:disk
Create a new icon from scratch
Copy an icon to an object of same type,type=disk,trashcan directory,data-file,programme, or non-dos-disk
Put the image of an existing icon into an iff file
Put workbench colours into a palette file to load into Deluxe Paint
Tell me how to load files created with ICON-MAKER onto deluxe paint
RAM Disk
Workbench

■ ***Icon Maker lets you convert designs created in art packages into clickable icons for your programs.***

LEGALLY SPEAKING...

Pac Man is a trademark of Atari Corp., and strictly speaking refers to the original pukka coin-op game and licensed conversions. Whenever we use the phrase 'Pac Man' is this article, we are referring to the general style of the game.

DISK

GIVING IT AWAY

Any program from our disk listed as 'Public Domain' can be freely copied, through your user club, bulletin board or whatever. Other programs – the ones credited to specific authors – are copyright to those people. They are not PD. If you want to sell copies of those programs, Format can put you in touch with the authors.

ST

ST SWITCH

Public Domain
All STs
FILENAMES: SWITCHER.PRG, SWITCHER.DOC

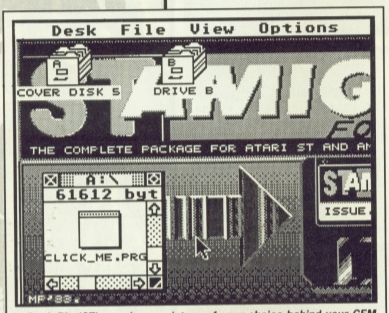
As every Amiga owner will tell you, being able to run more than one program at once can be a real time saver. While the Amiga offers true multi-tasking, the ST's operating system is of a more conventional nature. Although no where near as sophisticated as true multi-tasking, it is possible to mimic multi-tasking, using the ST's machine-code interrupts.

ST Switch lets you run two programs simultaneously by partitioning the ST's memory into two independent halves. These two sections of memory both act as a normal ST RAM environment and you can therefore run two programs at the same time, memory-size permitting. For example, you could have a word processor running in one half and the ST's Desktop in the other. By simply swapping partitions, you can have full access to the Desktop without ever having to leave your w/p, a real time saver.

Sounds great doesn't it! Well, there is a snag. ST Switch is not the most reliable of programs and can sometimes crash when memory gets short. The rule with this one is 'Don't trust any valuable data to ST Switch'. Always remember, if you have twice as many programs running, you could lose twice as much data when the machine goes down.

ST Switch won't run from our menu program (although our menu program will run from ST Switch!) as it requires a certain amount of setting up. First, copy the file SWITCHBT.PRG into your work disk's AUTO folder. Now reset your ST and SWITCHBT will be executed. SWITCHBT is very polite and asks you whether you want to split RAM; type Y or N and press RETURN. If you enter Y, your ST will reset itself and reboot with two partitions under the control of ST SWITCH.

To switch between the two, press [Ctrl] and both [Shift] keys. ST SWITCH works best on 'well behaved' programs such as word processors. For optimum efficiency, use a mono monitor. ST SWITCH was designed as a 'fun' program and shouldn't be taken too seriously.



■ *Desk Pic (ST) can drop a picture of your choice behind your GEM desktop screen.*

DESK_PIC

Program: PD
Picture: Michael Pease
Colour STs only
FILENAMES: DESK_PIC.EXE, DESK_PIC.PRG, FORMAT.SAS

Let's face it, the ST's Desktop can get a little monotonous after a while. Wouldn't it be nice if you could add a little variety to it once in a while? With DESK_PIC and a Degas format picture you can.

DESK_PIC loads a Degas format picture into the backdrop screen of the ST's Desktop. We've provided a nice picture sent to us with the program to give you an idea of what is possible. If you're the owner of a paint package that supports the Degas file format or if you have any Degas pictures then by simply replacing the file FORMAT.SAS with your Degas picture, you can a picture of your choice gracing the Desktop.

You'll find DESK_PIC.PRG in the AUTO folder of this month's cover disk. To use DESK_PIC, the program and its accompanying file, DESK_PIC.EXE, must be copied into the AUTO folder of your workdisk and your picture file, FORMAT.SAS, must be present in the root directory.

ETERNAL RAMDISK

Public Domain
All STs
FILENAMES: ETERNAL.PRG, CONFGRAM.TOS, ETERNAL.DOC

RAM drive are wonderful things. They operate at a speed that not even a hard drive can match, and never need a low level format! But if you reset your machine or if something causes it to crash, you can say goodbye to your RAM drive. Until now, that is. *Eternal* is a fine example of a recoverable RAM drive, much like those already available to Amiga owners.

Eternal won't run from our cover disk menu program, CLICK_ME, as it has to be run at start up. To use it, copy the file ETERNAL.PRG into your work disk's AUTO folder. Make sure it is the first thing you put into the folder, as Eternal must be the first program executed on start up. Next, copy CONFGRAM.TOS into the same AUTO folder. To configure the RAM disk (set it size etc), run CONFGRAM and answer the on screen prompts.

The next step is to install the RAM drive on the Desktop. Click on the A: drive icon and select 'Install Disk Drive' from the Options menu. Enter the same drive letter you entered in CONFGRAM (don't press [Return]) and then click on the Install gadget. A disk drive icon now appears. Select 'Save Desktop' from the options menu and the set up is complete. Reboot your ST and your Eternal RAM drive will appear.

When your ST crashes or you reset it, you must boot with the disk that holds the RAM drive program, otherwise your Eternal RAM drive will be destroyed. For more information on copying files and installing disk drives, refer to your ST users manual and the 'How to use this disk' page at the end of this section. Full instructions can be found in Eternal's folder.

DUNGEON MASTER CHEAT

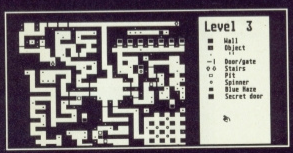
By Edward Penman
All STs
FILENAMES: DMCHEAT.PRG, DMCHEAT.DOC

If you fancy yourself as a bit of a dungeon master, with a flair for dungeon architecture, then Edward Penman's *Dungeon Master* cheat should prove a great help. Ed's great little program allows you to change the layout of the first three levels of MirrorSoft's best seller.

The Dungeon Master cheat lets you completely redesign the floor plan of a dungeon, move doors around and generally have a good time playing god with the inhabitants of the dungeons.

Load the Dungeon Master cheat program from our cover disk menu program, CLICK_ME, or by clicking directly on its icon on the desktop. Full instructions are included within the dungeon master folder under the file name of DMCHEAT.DOC.

WARNING: the program saves a modified 'save game' file with your new designs in it, so if you have a part-completed game using the original dungeon layout and want to retain your position, save and load the cheated file to and from a disk other than your Dungeon Master disk.



B BOOT
by I. Mitchell and Richard Monteiro
All STs
FILENAMES: B_BOOT.PRG, B_BOOT.DOC

You may remember that Issue 3's *Desktop* section featured a tip to let your ST boot from drive B:. This unfortunately involved subjecting your ST to surgery with a blunt soldering iron – understandably too much for most people's stomachs. If you're one of those people who just can't face the agony of a hardware modification, then help is at hand in the form of B BOOT.

B BOOT is a software solution to the problem. There's no soldering involved. In fact, you don't have to open your ST, so your machine's warranty will not be affected. Just run the program once and your ST will boot from drive B: until you decide enough is enough and switch the machine off. There must be a catch you're thinking. Not so, just run once and that's it. All this in just 131 bytes!

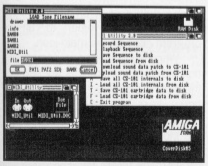
B BOOT is designed to sit in the AUTO folder of a disk. When you boot with this disk in drive A, as soon as B BOOT has been executed the boot process is transferred to drive B. The nice thing about B BOOT is that it will survive all system crashes and even if you reset the machine, B BOOT will continue doing its stuff.

For details on how to copy B BOOT, refer to the 'How to use this disk' section on page 80 of this month's *Format*. Full program instructions can be found in the B_BOOT folder.

AMIGA

MIDI UTILITY
Public Domain
All Amigas
FILENAMES: MIDIUtil, MIDIUtil.DOC

Over the past couple of years the computer has become as important to the musician as his synthesiser. Many top musicians, such as Vince Clarke of Erasure who uses a BBC micro and the Pet Shop Boys who use the now famous Fairlight CMI, rely heavily on computers in one form or another. With *MIDI Utility* and a suitable MIDI interface, your Amiga can also get in on the act.



■ *MIDI Utility (Amiga) doing its stuff with our inimitably home made ST Amiga Format Amiga MIDI interface.*

MIDI Utility is a comprehensive collection of useful MIDI utilities all contained in one program. Using a MIDI keyboard and MIDI Utility, you can record sequences and have your Amiga play them back. If you're lucky enough to own a Casio CZ101 synth, then MIDI Utility could prove to be a great asset. The program allows you to upload and download both sound patch data and the CZ101's internal voice data to and from the Amiga via a MIDI interface.

To start your journey to international stardom, you can load MIDI Utility from both our cover disk menu program, Click_Me, and from the Workbench. Full instructions can be found in the MIDI Utility drawer.

DX VOICE FILER
Public Domain
All Amigas
FILENAMES: VoiceFiler, VoiceFiler.DOC

The Yamaha DX series of synthesizers have probably become the most popular keyboards available on the market. The range spans a wide variety of synths of varying complexity, from the low cost DX100 right up to the latest addition to the range, the DX7-2S. One of the main selling points of the DX synths has been the versatility and ease of use of their voice editing facilities. Once a voice has been produced, it is nice to be able to keep it for future use and this is where DX Voice filer comes in.

DX Voice filer lets you download your Yamaha voice files through a MIDI interface and as it 'appens Guv, *Format* have got this nice little DIY MIDI interface on offer this month. Turn to page 17 for further details.

Another useful function offered by Voice filer is a random voice generator that can be used to produce some interesting sounds on your synthesiser. This feature alone makes Voice filer instantly useful.

Due to the number of Synths within the Yamaha DX range, it would be practically impossible to give full instructions on how to use Voice Filer on the synth end of the MIDI link. For full details of setting up your synth to transmit voice data, refer to your DX owners manual or alternatively, have a friendly chat with your local Yamaha DX dealer who should be able to help.

You can load Voice Filer directly from the Workbench by clicking on its icon or from our cover disk menu program, Click_Me. Full instructions are included within the Voice filer drawer.

CHEATS
by Peter Featherstone
All Amigas
FILENAMES: Cheat, Cheat.DOC

Welcome to this month's underhanded gameplaying corner. If you're one of the many who are stuck on either *Ikari Warriors* or *Beyond the Ice Palace* from Elite, then Pete's game-busting cheat routine is for you.

The cheat routine cannot be loaded from either the Workbench or our cover disk menu program but has to be loaded directly from the CLI. Don't worry, this isn't too difficult! Firstly, boot your Amiga with a standard Workbench disk and once loaded, enter the *system* drawer and click on the *CLI* icon. A small CLI window will appear. If everything has gone OK so far, remove your Workbench disk and insert the coverdisk in your internal drive (DF0:). Now type `DF0:GAMEBUSTERS/CHEAT` and press [Return]. The cheat program will now load.

GOMF!?!
GOMF's rather strange name is an acronym for 'Get Outta My Face'. This rather strange expression, made famous by Tubbs in Miami Vice, is supposedly what is uttered by American programmers when their Amigas crash. Strange people those Americans!

GOMF 1.0
Public Domain
All Amigas
FILENAMES: Gomf1.0, Err1, Gomf.DOC

The Amiga's multi-tasking operating system is among the most sophisticated available on any micro. Through the use of an advanced message passing system controlled by the multi-tasking executive, the Amiga was one of the first micros to offer a true multi-programming environment. Even so, the Amiga has gained itself a reputation for being rather unstable. The infamous 'Guru Meditation' has become the Amiga owner's number one wind-up.

If you've ever experienced a software failure then you'll know how frustrating it can be. Hours of work can be lost in seconds due to some run-away program that decides it would be nice to completely trash exec's workspace. If you're a victim of exec then help is at hand in the form of *GOMF*.

■ *Wouldn't you rather have this nice friendly screen than a dose of Guru Meditation messages?*

GOMF wedges itself into the operating system and monitors all goings on. As soon as things start to get a little hairy and there is the slightest possibility of a system failure GOMF steps in and halts the machine. From this state you can choose to kill the offending task in its tracks, thereby avoiding another kick in the Gurus. GOMF won't stop all software failures but it does manage to trap a large percentage of them.

You can load GOMF from our CLICK_ME menu program by selecting it from this month's list of programs or alternatively, it can be executed directly from the Workbench by clicking on its icon. Full instructions are included in the same drawer as the main program.

Living happily within the GOMFdrawer is another program, called ERR1. This program can be is used in conjunction with GOMF to demonstrate how wonderful it is. ERR1's sole role in life is to crash your Amiga in as many ways as possible and so therefore be very careful with it. Always install GOMF *before* running ERR1 or your Amiga will have a fatal attack of the Gurus every time.

DISK

HOW TO USE THIS DISK

DISK DOCUMENTATION

Many of the programs on *ST Amiga Format* disks are Public Domain. In such cases we've simply passed on their standard documentation files unchanged, as is required by the PD code of practice. Some of the phrasing is 'idiosyncratic', shall we say, so please don't blame us for misspellings!

The *ST Amiga Format* cover disk is a special format disk which both the ST and the Amiga can read. Even if you are a seasoned computer user, please read these instructions carefully or you could permanently damage your copy of it.

The first thing you must do is make a backup copy of the disk. Because of the special format, the normal disk-to-disk copying methods, as recommended in the Amiga and ST manuals, won't work. Instead you will need to format a blank disk and copy the files individually. Don't panic, this isn't at all difficult.

HAVING TROUBLE WITH THE DISK?

We have done our best to check that the programs supplied on this month's disk are simple to use, error free and have no known viruses. However, we cannot answer telephone queries on using the software, and we do not accept liability for any consequences of using the programs.

If your ST Amiga Format disk is faulty – and out of 40,000 duplicated some are unfortunately bound to be – you should send it back for a free replacement to:

ST Amiga Format November Disk, DisCopy Labs, 20 Osyth Close, Brackmills, Northampton NN4 0DY.

AMIGA OWNERS: if your Amiga refuses to accept the disk, try using the DISKDOCTOR utility on your Commodore Workbench disk to rescue it before sending off for a replacement. We covered DISKDOCTOR fully on page 93 of Issue 1. Don't worry if every track gives you a 'hard error', this is the Amiga being unable to read the ST software on the disk.

WE WANT TO GIVE YOU MONEY!

If you've got any programs for either ST or Amiga which you think other readers would find useful, interesting or amusing, we'd like to know. Here's how to go about securing international fame for yourself:

1. Only send in programs on 3.5" disks; we cannot accept printed listings.

2. Make sure your disk is clearly labelled with your name and address and the program name(s), and is marked 'ST' or 'Amiga'.

3. Make sure there's a documentation file on the disk called README.

4. Enclose a clear covering note explaining what the program does, and if you possibly can please also send a printout of any on-disk documentation files. Remember your address and telephone number. Include a stamped return envelope for the disk if you want it back.

5. THIS IS IMPORTANT: there must be a signed statement that the program is yours and that you are prepared to assign publication rights to ST Amiga Format. Use the following wording:

The program/s (write the title here) is/are submitted for publication by ST Amiga Format magazine. It is my own work and has not been submitted for publication elsewhere.

Signed ...

If we accept your program, we will get in touch with you before publication to agree terms and payment rates. We will evaluate all submissions in a batch once a month, so please allow up to 40 days for return of your disks. We will only send back disks with adequate return postage and packing.

6. If you send us a disk with a virus on it, we reserve the right to send round the heavy mob in the small hours and do unspeakable things to your pet budgie. Seriously, since we've already supplied Virus-killer programs (in Issue 1), do check your disks very carefully.

ON THE ST
(assuming a single drive machine)

1. Take a blank disk and format it in the usual way.
2. With the blank disk still in the drive, double click on the A: drive icon to open up the (blank) contents window.
3. Now drag the icon for drive B: into the open window of disk A. This will copy all the files one by one off the master disk to your new disk. *Make sure that the master ST Amiga Format* disk is write protected (the sliding tab should be back so the hole is open) and put it in the disk drive when asked for disk B.
4. You will now be prompted at various times to insert disk A and disk B while copying takes place. There will be a lot of swapping to do on a single drive ST! Disk B should be the master disk, disk A your newly formatted copy.

If you want to cut down on disk swaps, you can use the Eternal RAM disk program provided on this month's disk as an intermediate step.

ON THE AMIGA
(assuming a single drive machine)

1. Start your Amiga up with your normal Workbench boot disk.
2. Take a blank disk and initialize it in the usual way.
3. *Make sure that the master* ST Amiga Format *disk is write protected* and put it in the disk drive. Double-click on the disk icon that appears. Drag any icons you see in the contents window onto the 'RAM disk' icon.
4. When the disk activity light has gone out, put your newly formatted copy disk in the drive instead. Double-click on the RAM drive icon to open its window, and drag program icons from that onto the new disk icon. This copies the files one by one.

The programs may not all fit in the RAM drive at once on an A500 – do whatever will fit, then after step 3 delete them from the RAM disk by clicking once on each and, holding the right mouse button down, selecting discard from the Workbench menu. Repeat steps 2 and 3 for the rest of the icons.

USING THE PROGRAMS

ON THE ST

When you turn the ST on and put your working copy of the disk in the drive, you will see a window opened with the contents of the disk displayed.

One of the icons is called CLICK_ME.PRG – just do what it says, double-click to run it. Up comes a list of the disk contents. Type the number of the program you want to run, and you are asked whether you want to read the disk help file or not.

You will now be asked whether you want to run the program or not. As an alternative to using CLICK_ME.PRG, if you know enough about GEM you can click directly on the icons for individual programs. These normally end .PRG with their documentation files having the same names but with .DOC filetypes. Always read the documentation before running the program.

ON THE AMIGA

Most of the programs on the cover disk are run from the Workbench, which must be loaded first from your normal start-up disk, as described in the Amiga manual. Once at the Workbench, put the ST Amiga Format disk in the drive and double-click on its icon to open it.

You should find on the disk an icon for a program called CLICK_ME, do exactly what it says and after a few seconds our cover disk menu program will have loaded. If you own a single drive Amiga then your machine will prompt you to swap disks a couple of times before the menu is loaded. Just follow the on-screen requesters and everything should load fine.

Most of the programs on the disk can be executed from CLICK_ME by selecting them from the menu and choosing either to view the program's documentation or load the program. If a program fails to load from this menu (this sometimes happens through shortage of memory on unexpanded systems), you can load it from the Workbench instead, by clicking on its icon.

To load a program from the Workbench, you must first Click open the drawer which contains it. For detailed comments from the program's author click on the .DOC file icon in the same folder; to run the program click on the main icon.

When you click on a documentation file, a new window is opened and the text is displayed a screenful at a time. Press any key to move from one screenful to the next, or click on the close gadget in the top left-hand corner of the window to cancel the display. The READ_ME icon gives you a brief summary of the disk's contents and how to use it.

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FREE STARTER KIT - Only From Silica

When you purchase any Atari ST keyboard, you will not only receive the best value for money computer on the market, but you will also receive the following from Atari Corporation as part of the package:

* BASIC Language Disk * BASIC Manual * ST Owners Manual * TOS/GEM on ROM
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In addition, we at Silica would like to see you get off to a flying start with your new computer, so we have put together a special **ST STARTER KIT** worth over £100, which we are giving away **FREE OF CHARGE** with every ST computer purchased at our normal retail prices. This kit is available **ONLY FROM SILICA** and is aimed at providing users with a valuable introduction to the world of computing. We are continually expanding the ST Starter Kit, which contains public domain and other licensed software, as well as books, magazines and accessories all relevant to ST computing. Return the coupon below for full details.

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At Silica Shop, we have a dedicated service department of seven full time Atari trained technical staff. This team is totally dedicated to servicing Atari computer products. Their accumulated knowledge, skill and experience makes them second to none in their field. You can be sure that any work carried out by them is of the highest standard. A standard of servicing which we believe you will find **ONLY FROM SILICA**. In addition to providing full servicing facilities for Atari ST computers (both in and out of warranty), our team is also able to offer memory and modulator upgrades to ST computers.

1Mb RAM UPGRADE: Our upgrade on the standard Atari 520ST-M or 520ST-FM keyboard will increase the memory from 512K to a massive 1024K. It has a full 1 year warranty and is available from Silica at an additional retail price of only £86.96 (+VAT = £100).

TV MODULATOR UPGRADE: Silica can upgrade the 1040ST-F to include a TV modulator so that you can then use it with your TV set. This is an internal upgrade and does not involve any untidy external boxes. A cable to connect your ST to any domestic TV is included in the price of the upgrade which is only £49 (inc VAT). The upgrade is also available for early 520ST computers at the same price.

THE FULL STOCK RANGE - Only From Silica

We aim to keep stocks of all Atari related products and our warehouse carries a stock of over £½ million. We import many software titles direct from the USA and you will find that we have new releases in range. In addition, we carry a complete line of all books which have been written about the Atari ST. A range as wide as ours is something you will find is available **ONLY FROM SILICA**.

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Rest assured that when you buy your ST from Silica Shop, you will be fully supported. Our free mailings give news of releases and developments. This will help to keep you up to date with new software releases as well as what's happening in the Atari market. And in addition, our sales staff are at the end of a telephone line to service all of your Atari requirements. If you purchase an ST from Silica and would like any technical advice, we have a full time technical support team to help you get the best from your computer. Because we have both the staff and the systems specifically dedicated to providing after sales service on Atari ST computers, we are confident that our users enjoy an exceptionally high level of support. This can be received **ONLY FROM SILICA**.

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At Silica Shop, we recognise that serious users require an in-depth information service, which is why we mail free newsletters and price lists to our ST owners. These are up to 48 pages long and are crammed with technical details as well as special offers and product descriptions. If you have already purchased an ST and would like to have your name added to our mailing list, please complete the coupon below. A return it to us. This information service is available **ONLY FROM SILICA**.

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We hope that the combination of our low prices, FREE UK delivery service, FREE Starter Kit and FREE after sales support, will be enough to make you buy your Atari equipment from Silica Shop. However, there is something you wish to purchase, and you find one of our competitors offering it at a lower price, then please contact our sales department, providing us with our competitor's name, address and telephone number. If our competitor has the goods in stock, we will normally match the offer (on a same product - same price basis) and still provide you with our normal free delivery. We realise that we are not the only company who will match a competitor's price. However, if you come to us for a price match, you will also be entitled to our after sales service, including free newsletters and technical support. This makes our price match promise rather special, something you will receive **ONLY FROM SILICA**. We don't want you to go anywhere else for your Atari products. So shop at Silica, the UK's No1 Atari Specialist.

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ATARI 1040ST-F - NEW PRICE

We are pleased to announce a new reduced price point on the 1040ST-F which is now available for only £499 (inc VAT). The 1040 is a powerful computer with 1Mb of RAM and also includes a built-in 1Mb double sided 3½" disk drive. The 1040 has been designed for use on business and professional applications most of which require a high resolution monochrome or colour monitor. It does not therefore have an RF modulator for use with a domestic TV set. Modulators can be fitted for £49 (inc VAT).

1040ST-F Keyboard / Without Monitor	*£499 (inc VAT)*
1040ST-F Keyboard + High Res SM125 Mono Monitor	*£599 (inc VAT)*

If you would like further details of the 1040ST-F, return the coupon below.

MEGA ST's NOW IN STOCK

For the user who requires even more RAM than the 520 or 1040 ST's offer, the new MEGA ST computers are now available. There are two MEGA ST's, one with 2Mb of RAM and the other with a massive 4Mb. Both new computers are fully compatible with existing ST's and run currently available ST software. The MEGA ST's are styled as an expandable Central Processing Unit with open architecture and a detachable keyboard. They are supplied with GEM, a free mouse controller and all extras as with the 520 or 1040. Prices are as follows:

MEGA ST 2Mb Keyboard + CPU	*£899 (inc VAT)*
MEGA ST 2Mb Keyboard + CPU + SM125 Mono Monitor	*£999 (inc VAT)*
MEGA ST 4Mb Keyboard + CPU	*£1199 (inc VAT)*
MEGA ST 4Mb Keyboard + CPU + SM125 Mono Monitor	*£1299 (inc VAT)*

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To: Silica Shop Ltd, Dept .ST.FM,1-4 The Mews, Hatherley Road, Sidcup, Kent. DA14 4DX

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REVIEW

ROBOKIT ST

PRL's PROSE software has been controlling industrial robots for some time – now it's available on the ST. You won't be able to make R2D2 fetch the tea for you, but with a good Lego set you'll discover robotics isn't just for people with three brains. Richard Monteiro, with no brain, tries it out.

£79.95 ■ ST only ■
Atari, Atari House, Railway Terrace, Slough, Berkshire, SL2 5BZ (0753 33344)

Unlike many products feathered under Atari's wing, Robokit is ready just six months after being announced. It may have something to do with the fact that Personal Robots Ltd (PRL) of Henley, the chaps responsible for the development and design of Robokit ST, have had an industrial version of Robokit on the go for some years. The board and software are ready. Now it's up to Atari to deliver the goods: they are responsible for production. Will it be available next month, next year or will the sky fall on our heads first? Who knows?

Bricks and walls

Robokit consists of interface, software and manual. While you can learn the theory simply by toying with the software, you will need a Lego *Technic* set of sorts to enjoy the practical side of robotics. Unfortunately the sets you require are expensive, since optical sensors, motors and other specialised gadgetry are a must. To make matters worse, the kits are available only from certain educational retailers (check out the panel for more on this).

The first stage is to build yourself a credible model from Lego. If you're stuck for ideas, the first part of the manual devotes over 40 pages to construction projects. Five projects are detailed: mini arm, lift operator, card reader, plotter, maxi arm. Whichever project you decide to undertake, the step-by-step instructions ensure you won't go wrong.

The manual was written at a time when Lego didn't have any kits containing microswitches. Hence the Blue Peter-style guide to making your own. The guide isn't obsolete as only the most expensive kits now contain such switches.

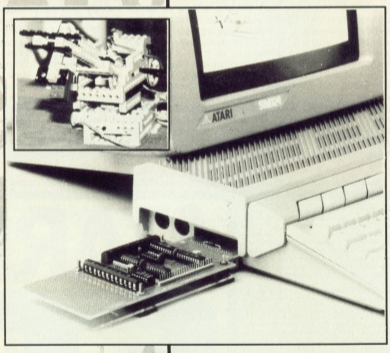
Along with construction details, the manual provides data for wiring the motors, sensors and switches to the Robokit interface. Once you've got a kit connected to the interface, you're ready to roll with PROSE – for Personal Robot Operating System and Environment.

Backdrop to the future

You will be prompted to load an 'RSU' file first off. RSU files are like GEM DESKTOP.INF files; they contain information on PROSE's screen layout. Unsurprisingly there aren't any RSU files with the virgin system: you must create them.

First you'll want to display an image (called a 'backdrop' by PRL) of the Lego device you are driving on screen. All projects listed in the manual have accompanying image files on the disk, and very dandy they are too. If you create a model other than those listed in the manual, you'll need to design your own backdrop. Any of Degas Elite, NeoChrome or GEM Paint can be used to create the backdrop.

The reason for having a stylised picture of the device plugged into the interface is solely to aid communication between you and the device. Icons can be added to the backdrop. These range from arrows (for representing movement in particular planes, perhaps) to hands (for halting all movement, say). None of the icons mean anything specific until you attach control power to them, and then they can be given any meaning you feel fit. Twenty icons exist with no



WE KNOW THAT!

The Robot Book mentioned in issue three, while indeed providing an informative read on all things robotic, contains details of many robot projects that can be built from Lego and Fishertechnik. Published by Windward it costs £7.95 in paperback and £12.95 in hardback. ISBN 0-7112-0414-4.

ABSOLUTE MOVEMENT

Instructions to the mini arm, or whatever kit is attached, can be bundled together to form sequences. Unless special instructions are sent, all movement is relative: execution of a sequence proceeds from whatever position the previous command left the model in. Sometimes this is unimportant and action can take place regardless of the robot's position. However, there are times when knowing the exact position of the robot or parts of its anatomy can be of the utmost importance. Similarly, you may want movement to start from a known position. Several Robokit commands cater for absolute positioning.

These commands rely on position reports from the robot; shaft encoders on the motors take care of this.

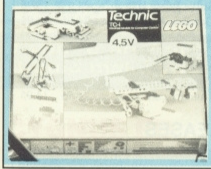
Before you can use encoders, you must 'initialise' them. They then need calibrating, which means attaching some unit of measurement of the clicks of the encoder switches. One possible way of doing this is to place the arm or other object in the most extreme position and inform the computer of this.

You can decide what distance you want a click of the encoder to represent. When the mini arm performs a complete circle about its vertical axis, for example, the encoder clicks 36 times; you might choose 36 clicks to represent 360 (the number of degrees in a turn).

KITS SUITABLE FOR CONTROL

Models built from Lego, Fischertechnik, Meccano, plastic, metal or balsa wood may all be controlled by Robokit. Lego is preferable as many of the kits comprise motors, solenoids and microswitches that are vital for producing robots. You can even rip out wires from a remote controlled car and connect them to Robokit.

Several Lego projects are included with the Robokit package – these are all based round Lego components. Lego supply some good designs with their 1090 and 1092 Technic Control Sets (which contain everything you need from basic building blocks to motors and shaft encoders). Unfortunately these kits form part of the schools range and aren't available in shops.



'Commotion' of 241 Green Street, Enfield, EN3 7TD (01-985 2391) can supply you with 1090 (£75+VAT) and 1092 (£99+VAT) packages along with other Lego parts. You can also approach Lego direct at Ruthin Rd, Wrexham, Clwyd, LL13 7TQ (0978 290900).

Many thanks to Commotion and Lego for their help – particularly to Lego who supplied a 1092 kit for use with Robokit.

provision for adding others or even editing existing ones – a pity.

Be warned, the software only works in high or medium resolution. Medium resolution backdrops suffer from being stretched horizontally and consequently are cropped top and bottom. In other words, a mono monitor is recommended. PRL promise that a scaling utility for medium res monitors will be included with the package Atari release.

Captain's log

Next stage is to add commands to the icons. For instance you can initialise a motor, make a motor rotate for a given amount of time in a given direction at a given speed, stop a motor and so on. Motor number, of which there can be eight, and output port number must also be supplied. Once this information has been subjected to the system, double clicking on the appropriate icon will cause part of the Lego kit to move.

You may find that the wrong motor moves, or a motor moves in the wrong direction, or for the wrong time. But it doesn't take long before you're in full control.

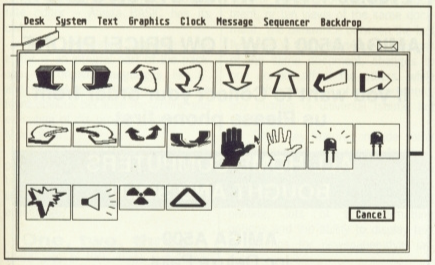
Robotics is all about letting some device get on with repetitive tasks. Essentially these tasks are programmed sequences of instructions – something PROSE is quite capable of. Sequences of messages are recorded by Robokit as you issue them; they can be replayed at any time, and may be attached to icons or even refer to other sequences.

There remains one last noteworthy technique offered by PROSE: Input Watching. This enables Robokit to watch for certain events – a switch closing because a buggy hits something – and then act accordingly. This can be likened to BASIC's IF...THEN statement, but is more powerful; the system looks for an event every five seconds in parallel with whatever else is going on and performs the consequent action immediately.

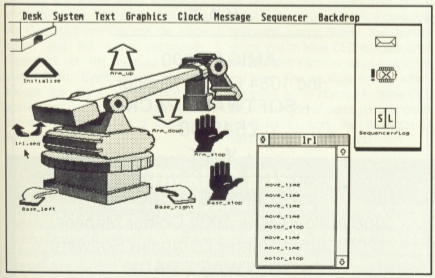
And for you?

Technical Lego is widely available – although specialised components might be harder to track down – and is a relatively cheap material for building useable models. The control software is very easy to use and is based on a proven industrial version. The manual is excellent with numerous pages spent on the correct kit, building models and hooking the finished models to the interface.

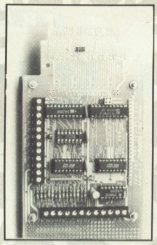
For educational establishments and anyone interested in understanding the basics of robotics, Robokit is a must. You won't be able to control a robotic lawn mower, but you'll certainly gain an insight into how these machines work.



■ *The 20 icons that can be added to the backdrop. Icons can have commands attached to them which tell motors and other components to perform certain jobs. For instance, a motor can rotate in a given direction at a given speed.*



■ *When you click on one of those icons a message is sent to the robot. These messages can be strung together in sequences and executed in one go. Hence the robot can perform mundane tasks indefinitely.*



LOSING CONTROL

The Robokit interface we had for review was very open – it didn't have a case. There were also holes in the breadboard for adding custom circuitry, and an empty chip socket for better motor control. Atari have plans to box the thing (amongst other indecencies) which seems pointless: while the interface might look prettier, the idea is ultimately to control your own robotic creations and be able to tinker with any part of the system.

for

- Excellent manual
- Control software is comprehensive without being difficult to use
- Features like event sensing allow good simulations

against

- Lego kits to control are expensive
- Doesn't work properly yet with colour monitors

features 0 1 2 3 4 5

performance 0 1 2 3 4 5

ease of use 0 1 2 3 4 5

manuals 0 1 2 3 4 5

format value 0 1 2 3 4 5

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REVIEW

AMIGA AMIGOS

If you're an Amiga programmer, then these two utilities should make your life a lot easier.

CYGNUS ED

£75.00 ■ Amiga only ■ Amiga Centre Scotland, 4 Hart Street Lane, Edinburgh EH1 3RN (031-557 4242)

What is a programmer's editor? It's not someone who leans over a machine coder's shoulder and says things like, "That sprite routine's rubbish – write it again". Rather, it's a sort of word processor especially for programming.

A lot of users will be baffled by that, because if you only program in Amiga BASIC, you won't need a separate editor – Amiga BASIC has its own.

In all interpreted languages, the editor is an integral part of the package. In compiled languages, like *C* and *Pascal*, the difference is much more obvious because the writing and executing of the program are distinctly separate.

But virtually all languages are supplied with an editor of some description, so why consider buying an editor like *CygnusEd* that doesn't come with a language?

One, two, three

There are, in fact, three good reasons. First, many standard editors are not particularly good. Second, if you program in more than one language, chances are you're using a different editor for each. By using something like CygnusEd you can use the same editor, and the same commands, regardless of the language you're using. Third, CygnusEd is powerful enough for most word processing applications, so you may not need to spend extra money on a dedicated WP package.

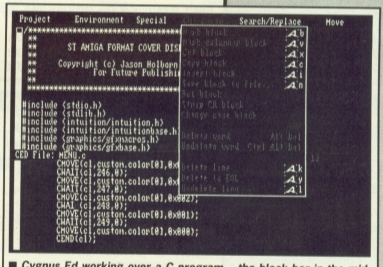
CygnusEd, or CED to its friends, is a Rolls-Royce among editors, and even a brief encounter reveals some very powerful features. For example, you can have ten document windows open simultaneously, with a variety of uses for each.

So, you could have ten different documents open, or you could have several versions of the same document, or ten views of the same document. The difference between the last two uses is that with different versions of the same document, changes to one do not affect the others, while with different views of one document, any change is universal (subtle but significant).

Other key features include some powerful word processing facilities, such as a lightning fast search & replace (including the unusual option of using wildcards), block cutting and pasting, lots of text formatting options and the ability to display text in columns for newspaper-style layouts.

But perhaps the most significant aspect of CygnusEd is the extent to which it allows you to set things up the way you want. Apart from choosing screen colours, there's a complete 'keyboard macro' facility. This feature allows you to have CED emulate virtually any text editor or word processor you wish. The package comes with a complete set of macros to allow CED to emulate MicroEmacs, or you could set it up to work like Wordstar (if that's what you *really* want).

Finally, no review of this product should pass without mention of features that make CED one of the most reassuring programs to work with. There is an autosave option which saves your work at regular intervals; should the worst happen there's further security with a file-recovery utility. If your Amiga crashes while you're editing, you can do a warm reset, run `RecoverCEDFiles`, and CED will retrieve from memory any files that were being worked on at the time of the crash.



■ *Cygnus Ed working over a C program... the black bar in the middle divides the two current editing windows. In this case, we're editing two different parts of the same file at once.*

TALKING EDS

"What about ED," some Amiga stalwarts will cry. ED is the Amiga's freebie text editor for writing CLI routines and the like. But anyone who has used it will be painfully familiar with the limitations of 'standard' text editors. Obscure commands and single line editing are among the biggest problems. It's just about usable for amending the start-up sequence. But if ED is poor for programming, it's an absolute write-off for word processing. The only thing you can say in ED's favour is that the price is right.

for

- **Highly 'customisable' and friendly**
- **Lightning fast – even with multiple windows open**
- **Fully compatible with multi-tasking AmigaDOS**

against

- **Weak for advanced word processing and document design**
- **Although clearly written, manual could be improved by use of sample screens**

features 0 1 2 3 4 5

performance 0 1 2 3 4 5

ease of use 0 1 2 3 4 5

manuals 0 1 2 3 4 5

format value 0 1 2 3 4 5

Obviously, success depends upon the relevant memory areas not being overwritten during the reset, but during testing CED managed a 100 per cent recovery record.

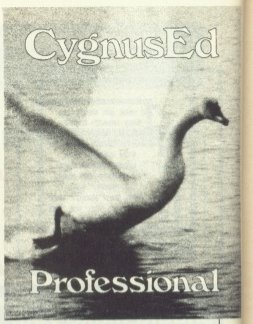
Too good to be true?

But despite all this power, CygnusEd is not only easy to use but easy to learn. Every major function is available from well-designed drop-down menus, and there are copious keyboard shortcuts for those who prefer to keep their hands on the keyboard during the writing process. Everything is simply explained in the manual, although some sample screens would have made things even clearer.

For word processing applications, CED is not perfect. For example, there's no built-in spelling checker, although you could use one of the many add-on packages available. Nor will it handle certain common WP functions like headers and footers or mail-merge, nor allow you to incorporate graphics into your documents.

However, for the basics of getting words onto paper, and for programming applications of all kinds, it's fast, friendly and powerful. In fact, CygnusEd is close to perfection.

Peter Worlock



ARP! EXCUSE ME

The ARP (AmigaDOS Replacement Project) was conceived by a group of top American software developers as an attempt to rid the Amiga of its frustrating (for programmers) BCPL-based operating system by rewriting the DOS library and most of AmigaDOS's commands in pure 68000 assembler. The ARP DOS commands not only run much faster but tend to be far more friendly with extensive wild card support.

Commodore have been offered ARP and if they accept, ARP could end up on ROM in future Kickstart releases.

WSHELL

£32.00 ■ Amiga only, all models ■ Amiga Centre Scotland, 4 Hart Street Lane, Edinburgh EH1 3RN (031-557 4242)

When the Amiga was first released onto an unsuspecting public, while much of its design was then unique for a micro, the basic workhorse of the system, (its disk operating system) was based on a rather creaky DOS called TRIPOS from Cambridge University.

AmigaDOS unfortunately inherited many annoying traits such as lack of command line history and line editing. Programmers often find AmigaDOS's quirky BCPL-written system structure more of a hindrance then a help and it is with all these points in mind that WShell was developed.

If you have used the famous public domain console handler, ConMan, the name of William S. Hawes will already be familiar to you. WShell continues where ConMan leaves off.

For those not in the know, ConMan is an enhancement of the standard AmigaDOS CLI handler which allows you to cycle through the history of previous command lines typed by pressing the up-arrow key, and to then edit a chosen line with the cursor keys and action it by pressing [Return]. Invaluable when AmigaDOS command lines can run to 80 characters – and one wrong key means retyping the lot!

Alias Smith and Jones

WShell includes the latest release of ConMan, version 1.1, and offers an extensive list of new features that greatly enhance it. For example:

■ Command Aliases: these allow you to define synonyms for regularly used commands. If you type `LIST PAT=#?.C` a lot, you could set up the shorter `LC` to do it for you.

■ Resident Commands: you can permanently install any command in memory so that the Amiga won't put up a disk change requester when you try and run it.

■ Built-in commands: the AmigaDOS commands CD, ECHO, IF, ELSE, ENDIF, PAUSE, PROMPT and a few other exotic directory swapping commands are permanently built into memory without you even needing to ask for them to be resident; unfortunately no DIR function is built-in.

■ There's a REXX language handler, for compatibility with other REXX programs. If you don't have any, don't worry.

■ Concurrent piping: the output of one task can be channelled to the input of another, even if the are running in parallel. This is like a concurrent version of the CLI's `>` operator.

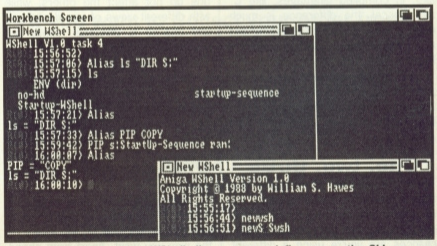
Many of WShell's features are inspired by the Unix environment, an increasingly popular operating system in America.

Getting up and running with WShell requires a certain amount of setting up, but thankfully all the hard work is handled by an AmigaDOS batch file that simply needs to be set in motion with the DOS command `EXECUTE`.

The WShell manual is generally well written and fully indexed which unfortunately has become a rare sight recently. Many software companies tend to rush program documentation which can have the effect of making a program completely unusable to the average user.

Although Workbench 1.3 features an enhanced console handler called AmigaSHELL, WShell should still be considered a must for all serious CLI-ers. WShell also includes the public domain ARP (AmigaDOS Replacement Project) files. The powerful features of WShell coupled with ARP make the WShell package a recommended purchase.

Jason Holborn



■ ***If you are determined to, WShell allows you to redefine your entire CLI command name system with its 'Alias' feature. Here we've begun setting up a Unix-lookalike where you type `LS` instead of `DIR`.***

features 0 1 2 3 4 5

performance 0 1 2 3 4 5

ease of use 0 1 2 3 4 5

manuals 0 1 2 3 4 5

format value 0 1 2 3 4 5

for

- Command line history
- Some commands built in, rest can be made resident
- Comes with ARP, the 'improved' CLI.
- Clear manual

against

- Once Workbench 1.3 arrives, the main benefits are free
- Some important commands missing from 'built-in' list

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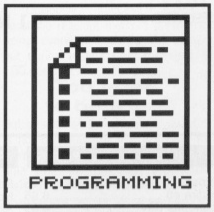


LEARN BASIC

We haf Arrays of making you talk. This month it's data structures and the different types of variables that BASIC supports. Simon Williams puts numbers in them, sticks words up them and pulls them all back out (sounds horrid!)

BIG NUMBERS

To give you some idea of the size of numbers BASIC can express, the estimate for the total number of sub-atomic particles in the universe is 10^{80}, which is a lot less than the size of the largest double-precision number.

In the first part of this series we looked at variables, the boxes where numbers or letters are stored within a BASIC program. There are two main types of variable: *numeric* for numbers and *string* for everything else. There's rather more to it than this, though, as numeric variables themselves can be divided into two sub-types: *integer* and *real*.

An integer variable is one which has no fractional or decimal part. The numbers 1, 287, 384623 and –78 are all integers, but 1.0, 287.35, 384623.1234267, –78.9 and 1 1/2 are not.

A lot of the numbers you use in programming don't need any decimal part and should therefore be defined as integers. There are three reasons for this: integer arithmetic is performed much faster than floating point (it's much easier for a micro to calculate 12 x 3 than 12.0 x 3.0), integers remove the possibility of rounding errors as they have no fractional part, and integers take much less space than equivalent reals. Integers take a maximum of four bytes each, while reals can take up to eight. Although this may not be important when programs are relatively short and numeric variables few, if you start using arrays, explained later in this exciting episode, the differences in space usage can be enormous. A bit of forward planning can mean the difference between running a program and having one which is too large to fit in memory. The variables and arrays used by a program can often take a lot more space than the program itself.

This isn't the end of it, though, as integers and reals can be sub-divided again. If you don't tell BASIC otherwise, integers are 16 bit (two bytes) long and have a range of –32768 to 32767. If you try and assign a number larger than this to a simple *integer* variable you'll get an error message. Power BASIC (though not Amiga BASIC) allows a second type of integer, the *long integer*, which takes four bytes and can represent any number from –2147483648 to 2147483647. Real numbers, in both BASICs, can have two *precisions*, which determine the size and accuracy of the number that can be represented. Single precision, which is the norm, can handle numbers up to 10^{18} (10^{38} in Amiga BASIC) with a resolution of about 7 digits. Double precision numbers can be up to 1.8 10^{308} (which is pretty big) and are accurate to around 16 digits.

Marking up

You may be wondering how BASIC can distinguish between all these different types of variable? Wonder no longer, it's all done with suffixes. You've already come across one suffix used in BASIC to define string variables. The dollar sign ($) added to the end of a variable name tells BASIC that its contents are a string of characters. Similarly, all the numeric types have suffixes. Integers use a percent sign (%), long integers an ampersand (&), single precision reals an exclamation mark (! – sometimes known as 'pling') and double precision a hash (#). For practice, name the following variable types:

```
No_of_stars&
Name$
Count%
Mass_of_Sun!
Time_to_end_of_Universe#
Total_insects
```

The last variable would be a single precision real, as this is what BASIC assumes if left to work it out for itself.

As an alternative, you can use BASIC's DEFxxx statements to specify a range of initial letters which automatically define a type of variable. For example, the statements:

```
DEFINT A-C
DEFLNG F
DEFSNG G-J
DEFDBL K-R
DEFSTR S
```

would define all variables beginning with A, B or C as integers, variables beginning with F as long integers, those from G to J as single precision reals and so on. You can use any single letter, range or ranges of letters to define a particular variable type.

Know what I mean, Array?

As you know, variables can be thought of as boxes in which you store words or numbers. For a lot of purposes this is all you'll need. There are a lot of other purposes, though, when you need a co-ordinated set of data which is difficult to create with independent variables. An array solves this problem by providing a structured set of variables which can be treated as a whole or through its component parts.

Picture an array as a set of lockers, say 10 across by five high (a total of 50 boxes). Into each of these lockers you can place data, and you can refer to any locker by its co-ordinates within the whole block, for example third locker along on the forth row up.

As arrays can be virtually any

High Quality Software
POWER BASIC
Interactive Compiler System
Atari ST Computers
Soft Software

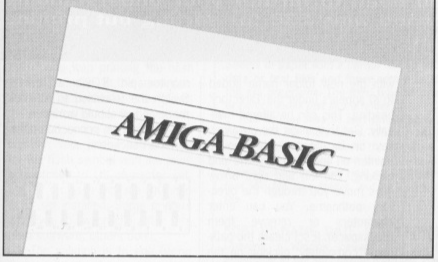
DOING IT FOR THE FIRST TIME

Using BASIC for the first time? Here's how to get the programs up and running:

Amiga BASIC first. Reset the computer and insert your Workbench disk into a drive. When the Workbench appears, replace the disk with the Amiga Extras/Amiga BASIC disk. An Extras disk icon will appear. Double click on this icon and wait for the contents of the disk to appear. Double click on the AmigaBASIC icon when you spot it. Amiga BASIC is now ready to use.

On the ST, insert either issue 2's cover disk or Hisoft's Power BASIC disk and press the reset button. If you're using the cover disk, double click on the CLICK_ME.PRG icon when it appears and then select the appropriate item from the menu. For the full version double click on the PBASIC.PRG file icon (or HBASIC.PRG if using the £79.95 HiSoft BASIC package). You're ready to roll.

Now read the rest of the article to find out how you can create BASIC programs.



size, BASIC demands that you set them up explicitly with the DIM command. This takes the form:

```
DIM Arrayname(x)
```

where 'Arrayname' is the name of the array (governed by the same rules used in naming a 'regular' variable), and 'x' determines the number of lockers in a row. You're not limited to a single row of lockers, though, and could set up a block of them as in the example with a command like:

```
DIM Locker$(10,5)
```

Note that the array name has a dollar suffix, indicating that it's a string array. Arrays take the same suffices as ordinary variables, and all elements ('lockers') in the array must contain the same *type* of data. The numbers specify a size of 10 by 5 elements. You can continue adding *dimensions* to the array by putting in extra commas and numbers of elements. For example, you could define a three-dimensional array (to make a cube of lockers) with the command:

```
DIM Locker$(10,5,4)
```

When you get above three dimensions, though, it gets a bit hard to visualise, unless you're into temporal distortion.

If you want the array to be available to sub-programs as well as the main program, you must add the word SHARED to the DIM statement. For instance:

```
DIM SHARED Locker$(10,5,4)
```

A good READ

The advantage of using arrays is that you can perform repeated calculations on numbers or strings in the lockers of the array. This is most easily done with a loop, such as a FOR...NEXT loop (covered in Issue 3) and is particularly useful when loading in or printing a lot of information. The program TELEPHON.BAS on the disk uses WHILE...WEND and FOR...NEXT loops to input up to ten names and telephone numbers into two arrays and then retrieve any number when given the name to search for.

There are two more commands which are very useful when reading into an array: READ and DATA. You can build information into your program by including it in lists after the word DATA, and read it into the lockers of an array with the READ statement. Have a look at this program segment to see how it's done:

```
DIM animal$(10)
FOR count=1 TO 10
READ animal$(count)
NEXT count
FOR count=10 TO 1 STEP -1
PRINT animal$(count)
NEXT count
DATA Aardvark, Glyptodon,
Armadillo, Sloth, Anteater,
Echidna, Pangolin, Tapir,
Capybara, Coypu
```

This program defines an array, `animal$`, and reads 10 animals' names into it with the READ statement. Each time a READ is performed the count variable is incremented so that the next READ fills another locker. The whole process of loading the data is carried out in just three lines of BASIC, as is the second part of the program, which prints out the animals' names in reverse order. When BASIC comes across a DATA statement in normal program execution, it ignores the line and goes straight on to the following one. You can therefore put DATA statements anywhere within a program. BASIC remembers which DATA items have already been read, though, and will always go to the next item with each new READ.

The second program, PHONEDAT.BAS on the disk shows how TELEPHON could be adapted to load names and numbers from DATA statements. PHONEDAT also uses a two dimensional array rather than the two single dimension ones in the first program.

LISTINGS ON DISK

To complement this month's instalment on data structures we have two short 'telephone list' style routines on the disk. They are deliberately short and simple: there is plenty of opportunity to improve or adapt them.

To load listings into AmigaBASIC, reset your Amiga and insert a Workbench disk. When the WIMP environment appears, replace the Workbench disk with your Extras disk. Double click on the AmigaBASIC icon after clicking on the Extras disk icon. AmigaBASIC will load. Go to the Project menu and select Open. Click on the Drawer requester and enter LEARNBASIC. Click on the Filename requester, insert the Format cover disk containing the BASIC files, type in TELEPHON.BAS and press [Return]. The file will load. You may run it by clicking inside the BASIC window and typing RUN (not forgetting to press [Return] afterwards). Use the filename PHONEDAT.BAS instead of TELEPHON.BAS for the second program.

Loading listings into PowerBASIC (demo version supplied with Issue 2 only): reset your ST and place the Issue 2 cover disk in the drive. Double click on the CLICK_ME.PRG file icon when it appears. Choose Power BASIC (F1) from the menu. Power BASIC will load. The BASIC listings are loaded into Power BASIC by inserting the current cover disk and selecting Load from the File menu. Double click on the TELEPHON.BA or PHONEDAT.BA file that appears in the file selector box. The chosen file will load ready for running. Unencrypted versions of these programs are also on the disk, with .BAS filetypes. These can't be loaded into our demo version of Power BASIC, but can be used with either the full version of Power BASIC or, with some modification, any other ST BASIC.

MARGINAL FACTS

Aardvark - a South American anteater
Glyptodon - a prehistoric proto-armadillo
Armadillo - a latterday Glyptodon
Sloth - slowest moving mammal in the world
Anteater - animal which eats ants
Echidna - spiney anteater
Pangolin - scaley anteater
Tapir - large mammal, related to the elephant
Capybara - world's largest rodent
Coypu - large rodent, imported for fur, now wild in East Anglia

RESTORE

If you need to move the data pointer back to the start of the DATA statements in a program, you can issue the RESTORE command to do just that. RESTORE can also be used to move to a label just before any DATA statement.

DESKTOP TIPS

Dodges, Enhancements, Secrets, Kludges, Tricks, and Oodles of Prizes – that's Desktop. All the facts you need to further your understanding of the ST. Roland Givan of Brentwood wins £30 for sorting out printing problems from First Word.

More Desktop

Further to the tips on hacking about with DESKTOP.INF published in issue two. Within the INF file you will find a line similar to `#G 03 FF *.PRG@@`. Try altering PRG to something else – RUN, say. If you reset the computer and try to execute any PRG files, you will find that you won't be able to. It's a great way of playing jokes on fellow STers. Altering file extensions from PRG to RUN will enable you to execute the files in the usual way.

R Henderson
Liverpool, Merseyside

Bright lights

Choose the paintbrush or pencil facility within Neochrome and press the right mouse button while the pointer is in the drawing area. You'll find that any lines you draw will appear multicoloured. Select colour-cycling for a really interesting effect.

Micky Ogawa
Hampstead, London

B for drive

The method of allowing software to boot from drive B as described by JR Mason in September's desktop is neither safe nor easy. A far simpler method is to load in a software patch from drive A which alters one of the ST's system variables. This then forces drive B to boot whenever a reset occurs. The assembly program below, written in Fast BASIC, forces drive B to boot when the reset button is hit.

```
RESERVE code%,$100
PATH$="A:\AUTO\"
ON ERROR CLOSE #file%:END
file%=OPENOUT "BOOT_B.PRG"
FOR Pass%=1 TO 2
[
OPT Pass%,"D+H+L-",file%
ORG code%
PEA boot_b(PC)
MOVE #38,-(A7)
TRAP #14
boot_b
MOVE #1,$446
MOVE.L $4F2,-(A7)
RTS
]
NEXT Pass%
CLOSE #file%
```

Save the code into an AUTO folder on drive A. When the machine is reset, the code will run forcing drive B to boot. Provided the machine is not switched off, all subsequent resets will cause drive B to boot.

On the cover disk in a folder called B_BOOT you will find an AUTO folder containing B_BOOT.PRG. Copy the auto folder and its contents to another disk. Insert the disk with the AUTO folder in the drive and press the reset button. Drive B will boot from now on.

I Mitchell
Camberley, Surrey

File selectors

The standard GEM file selector isn't mentioned at all in the ST owner's manual, so here are some notes concerning its use.

A file can be selected by either double clicking on the appropriate filename or by typing in the name at the file selection prompt and pressing [Return].

A list of all available files is shown in the box headed by the title bar. Only nine filenames can be displayed in the box at once; the others can be viewed by clicking on the arrows at top and bottom of the box. Alternatively the scroll bar can be dragged in an upward or downward direction. Any items with a diamond icon to the left of them are folders, not files. These can be opened by clicking on them once and usually contain more files.

If you click on a folder the new pathname (the previous path with the new folder name added to it) appears under the 'Directory' heading. This can be altered manually. Get to it using the up arrow key or by positing the mouse pointer on the Directory line and clicking. The left and right arrow keys move you through the directory pathname. You can enter characters or remove them (Backspace). [Esc] clears the pathname completely; clicking on the title bar restores the pathname to A:*.*

To register any to the pathname, either click on the title bar or anywhere underneath it. To exit a folder click on the 'close box' icon on the left of the title bar.

Incidentally, as well as using the wild card character * – which is used to replace either the name or file extension (PROGRAM.* or *.BAS) – in pathnames, the question mark (?) can also be used. This replaces a single letter in the name or extension. For instance, *.B?? or D?S?T?P.I?F.

I Mitchell
Camberley, Surrey

Scart races

Medium resolution displayed on a television leaves a lot to be desired. The way round this is to buy a £400 colour monitor – fine if you've got that sort of dosh to throw around. However, there is an alternative if your television is fitted with a scart socket. It will look something like:

This socket offers a much improved picture. Unfortunately there is more than one scart standard. When you purchase an Atari-to-scart lead you will find that it's wired to CAA 1 specification; this may work fine on some televisions. If not, then try the following alterations: connect Atari monitor pin 8 (12 Volt pullup) to scart pin 8 and place a +1 to +3 Volt dc level on scart pin 16 (this can be derived from the 12 Volt Atari monitor pin 8 via a resistor. Switch the television to AV (VCR) mode and all should work.

Here's a pin connection table for scart sockets:

pin	VCR standard	CAA 1 standard
1	sound out (r)	n/c
2	sound in (r)	sound in (r)
3	sound out (l)	n/c
4	ground	ground
5	ground	ground
6	sound in (l)	sound in (l)
7	blue	blue
8	12 V pullup	n/c
9	ground	ground
10	n/c	n/c
11	green	green
12	n/c	n/c
13	ground	ground
14	n/c	n/c
15	red	red
16	RGB status	n/c
17	ground	n/c
18	ground	ground
19	n/c	n/c
20	sync	sync
21	ground	ground

Note that the sync signal is derived by connecting two 470Ω resistors to Atari monitor pins 9 and 13, and then combining the two resistors at scart pin 20. Only one ground connection needs to be made.

Format health warning: this wiring requires some soldering. Don't attempt the project if you are unsure what a resistor is or have never used a soldering iron. Remember, most ST repair shops will be able to make one of these ST-to-scart connectors for you. Of course, it will cost more than making it yourself, though.

Mark Doxey
Failsworth, Manchester

Perverted characters

When you're using ST BASIC try pressing [Control] while hitting keys on the keyboard: you'll discover an abundance of extra characters.

Philip Shore
Hitchin, Hertfordshir

Last word on First Word

Having trouble printing all the ST's symbols from First Word? Here's a solution, but first a paragraph of explanation.

Most printers have different character sets from the ST; some (Brother HR5, for instance) can't even cope with printing the hash (#) and pound (£) in the same document. The problem is, as far as the printer is concerned, that both symbols occupy the same ASCII number. Your printer will print '#' for the hash symbol with the printer switched to US character set, but, '£' for hash with the UK character set installed. Some printers allow you to switch character sets from software, others don't.

The solution is to edit (using First Word) the printer driver for your printer and re-install it. For the HR5 it is best to start on the file ASCII.HEX which can be found in the PRINTER folder. In the part marked "Translation table" find the line

```
9C * No pound sterling
```

and replace it with

```
9C, 1B, 4B, 06, 00, 12,
7E, 92, 92, 42, 00
* Pound sterling
```

What the hex numbers mean:
9C – Atari code for pound sign.
1B, 4B – puts the printer into standard graphics mode.
06, 00 – tells the printer to expect six columns of graphic data
12, 7E, 92, 92, 42, 00 – data making up pound sign

Save the modified file and run the Install program to create a new version of 1ST_PRNT.DOT. Move this file into the same directory as First Word. Also make sure that the printer is set to USA character mode.

If you don't have an HR5, consult your printer's manual – the principle's the same. You will also have to determine how large characters are so that the graphics symbol will fit in exactly one character space. Using a similar method it should be possible to print any of the ST's peculiar character set. However, as the characters end up as graphic data, effects such as bold and underline won't work.

Roland Givan
Brentwood, Essex

STAC stuff

By altering system messages 9923 and 9924 you can change the colours on the top line of the screen. You can even add graphic characters or sound (look at Shymer, for instance).

Certain messages and condition lines on the 'quickstart' file are not always required. Message 9933, for example, will only be used if you are coding a two-part game. Once deleted these will save a little memory. IFs and extra spaces are also memory hungry. They can make messages look untidy and take up precious bytes. Locations with large pictures only need small textual descriptions.

Low priority commands, which give general replies ('You can see nothing special.', 'You fly into the air.' and so on) should be added only when everything else has been tested. Try to put a general reply for as many words as possible:

JUMP: "Wheee! Isn't jumping fun?"
HELP: "Pay me lots of money."
DIG: "You can't dig here!"

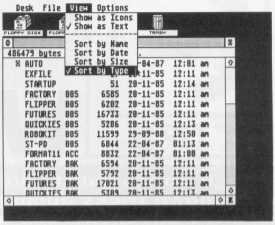
R Henderson
Liverpool, Merseyside

BEGINNER'S CORNER

VIEW MENU

The third option in the menu bar is View; this lets you control file display. For instance, files can be displayed as icons or text and may be sorted in a number of ways.

Make sure you have a window with several files in it displayed on screen. Move the arrow pointer to the View option; a menu falls down. You should see a number of items – two of which have ticks to the left of them. These ticks tell you which options are currently selected. For arguments sake assume "Show as Icons" and "Sort by name" are tagged like this. These options mean that files will be represented by icons and displayed in alphabetical order.



■ *The View menu allows you to alter the way files are displayed on screen.*

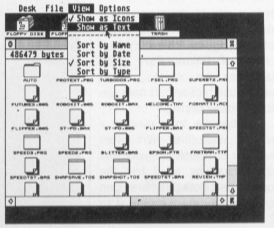
SHOW AS TEXT

When 'Show as Icons' is selected, all files are represented as icons with their filenames beneath. Sheets of paper with a corner folded over represent data or text files and those with a solid bar at the top are programs. The third type of icon is the folder (which looks just like a folder).

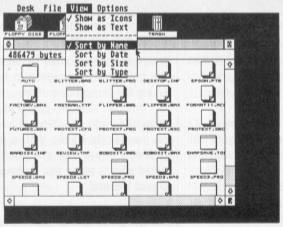
To display files as text simply click on 'Show as Text' from the View menu. When a file is displayed as text, the window shows the filename and size as well as the date and time the file was last modified. A small diamond icon next to a filename indicates that the file is a folder, not an application or text file.

SORT BY NAME, DATE, SIZE OR TYPE

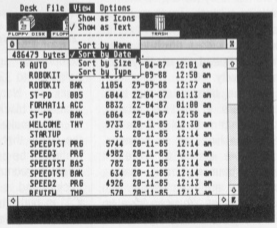
Opening a window causes files to be ordered according to the sort option from the View menu:
Name – displays files in alphabetical order.
Date – lists files chronologically. The most recently created or revised file appearing first.
Size – lists files according to the number of bytes they occupy – largest first.
Type – shows files alphabetically according to their extensions.



■ *And again... this time files are ordered according to the extension.*



■ *This time files are shown as icons in alphabetical order.*



■ *The same files shown as text in Date (chronological) order.*

TIPS WORKBENCH

Enough tips to satisfy Alex Higgins on a bad day – two pages of hitherto unknown tricks about the Amiga and its software. This month David Millard from Gloucester wins £30 for his neat method of creating animations on *Deluxe Paint*. Could it be you next time?

Deluxe Animator?

Here's a way to get simple (one colour) animations of up to 30 frames using the 'colour cycling' facilities of Deluxe Paint. With adaptation, the same method could be used for any art package offering colour cycling.

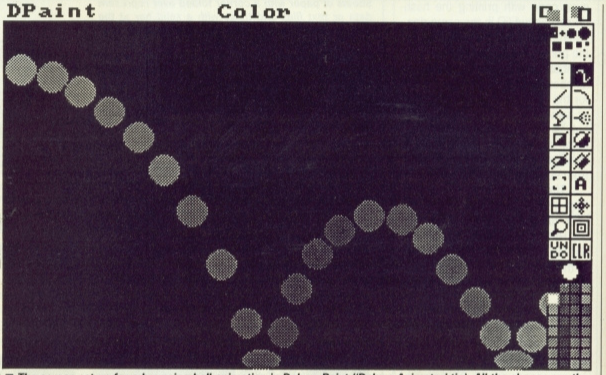
For example, try making up a bouncing ball animation. This could just be a ball dropping and rising, squashing as it hits the ground. The colours that are open for you to use are numbers 3 to 32 on the palette. Select colour 3 and draw a filled circle at the top centre of the screen.

Now draw a sequence of balls of the same size falling to the bottom of the screen – the best way to do this is by picking up the first circle as a brush. Try to make the gaps between each ball bigger as they drop further down – in real life balls speed up as they drop under gravity.

At the bottom of the ball's path where it hits the ground, draw a flattened oval is if the ball was squashing as it bounces. Draw more circles to represent the ball bouncing back, making sure there are no overlaps with existing circles. You can have up to 30 objects on the screen, one of each of the last 30 colours on the palette.

For a quick preview, press the [Tab] key (above [Ctrl]) and you'll see the colours cycle – but it gets better.

Go to the palette editing menu (by pressing P). Redefine all the colours 3 to 32 as black – the best way to do this is to click on colour 32, drag its colour bars to black, click on colour 3, drag its bars to black, then you can change all the rest at once by clicking on 'Spread' (you will see the cursor change to a 'TO' prompt) and then clicking on colour 32 again. This makes colours 3 to 32 an even spread of black to black in 30 delicate shades of black.



■ *The screen set up for a bouncing ball animation in Deluxe Paint ('Deluxe Animator' tip). All the shapes are the same except for the two positions where the frog hits the ground.*

Now make colour number 32 the shade that you want your animation to be seen in – something bright to contrast with the black background is good. Check that 'C1' is highlighted in the 'Range' bar of the palette menu, click on colour 3, click on 'Range' (the cursor changes to a 'TO' prompt) and click on colour 32.

If you don't use all 30 colours in your animation, just end the defined range of colours after the last colour you do use, and make that last colour the one which is different from the background.

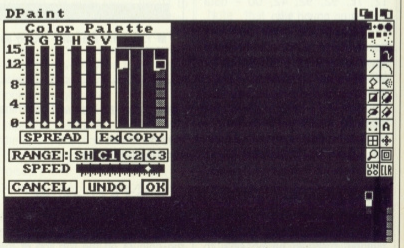
Save your new palette, and you'll see that only one of your balls is visible on screen now. Press [Tab] and the whole lot should animate for you in a cyclic arrangement. What is happening is that the one colour which *isn't* black among colours 3 to 32 is progressively assigned to each of the balls in the sequence in turn, giving the illusion of motion.

You can alter the speed of the animation with the 'Speed' slider on the palette menu. With a little experience you can get sophisticated effects using this technique.

David Millard

Gloucester

■ *Workbench editor adds: a useful tip when trying to draw 30 objects, each the same but one palette colour on from the last, is to use Deluxe Paint's 'Cycle Draw' command. Pick up the object as a brush, from the*



■ *Setting up the palette for the bouncing ball. Only colours 3 to 26 are used, so the Range (marked by the white line on the palette) ends after number 26.*

'Modes' menu choose 'Cycle'. Each time you click to paste the brush down it will increment the palette colour for you in sequence.

Quick draft printing

Even if you have a printer with front button controls which allow you to select NLQ print, 12 pitch text and so on manually, you will find that each time you print a document from your word processor, the settings are always overridden by whatever was set up in your Preferences.

You could go into Preferences and change the settings, but here's a simpler method: set your printer up to the typestyle you want, using its front panel buttons. Assuming it is connected to the Amiga via the parallel port, print your document by going to the program's Save menu and typing `PAR:` as the filename to be saved. This sends the text directly to the parallel port, ie the printer. You may find your line breaks don't come out correctly – if your application program has a 'Print to Disk' option, use that instead, giving PAR: as the disk file name again.

This should work on most programs. If you get an 'illegal filename' message or something similar when you save to PAR:, try saving to 'PAR:DUMMY' instead – that fools programs into believing it's a real filename.

Incidentally, if you're using the standard ED editor to prepare a program file, the command `SA /PAR:/` (or `SA /PRT:/` if you do want to go via the printer Preferences settings) prints your file for you without the need to quit ED.

David Twigg-Flesner, Germany and others

Quick CLI

If you want to get a quick CLI window, rather than booting up your Workbench and then running the CLI icon, just press [Ctrl]D repeatedly as soon as the Amiga's startup sequence gets going.

[Ctrl]D interrupts the execution of any command file (as run with the EXECUTE command) so it aborts the STARTUP-SEQUENCE file before the Workbench can load, leaving you with the CLI '1>' prompt.

What's in a name?

There's nothing special about the names the Amiga has for its CLI commands, they can be anything you want. When you type a command like DIR at the CLI, the Amiga goes away and looks on the disk for a file called DIR. If it finds one, it runs the program in that file.

Most AmigaDOS commands are kept in the C directory of the startup disk. So, suppose you are used to a CP/M system where the command to delete a file is ERA (for erase) rather than the usual DELETE, no problem:

Get to the CLI prompt (click on the 'CLI' icon in the System folder of your startup disk); Type

```
CD C
RENAME DELETE ERA
```

and from now on the command ERA will delete files for you. You can undo the change merely by renaming the file back again. This renaming trick works for any of the commands whose files are in the C or SYSTEM directories.

Coloured prompts

In the August issue you saw how to change the colours of text displayed on screen using ANSI escape codes and the ECHO command. The same technique can be used with the PROMPT command for a pleasant effect. At the CLI, type:

```
PROMPT "*e[33;1m%N>
*e[0m" [Return]
```

The '*e' escape codes in this string make your CLI prompt appear in orange text (the *e[33) and emboldened (the 1m), and the %N turns the prompt into the number of the current task, which is normal. The *e[0m reverts to white for the command line itself. This way you get a nice contrast between prompts and commands/responses.

Finally, here's a challenge to knowledgeable Amiga users: what is the significance of the numbers you get with each prompt after a `PROMPT "%N %N %N %N %N..."` command? The first is obviously the number of the current CLI task, as usual, but the rest of the numbers seem to go on for ever, some changing others not.

Michael Saunby
Camberley, Surrey

■ *Workbench editor adds: we're puzzled by the extra numbers too. It's probably a (benign) bug in the prompt command, and you're seeing a sequence of memory locations in the task control block. One of the numbers might be the task priority, for example. Maybe you could write a complete memory editor using only the PROMPT command?*

Right DIRection

The DIR command is one of the most used CLI commands, displaying all those files invisible from the Workbench icon screen.

Typing `DIR` gives you a list of files and sub-directories in the current directory. However, there are three options:

`DIR OPT A` – 'A' is for 'All'. When DIR finds a directory, if the A option is in force the Amiga will list out all files in that directory, and all files in any sub-directories too. In other words, all files on the disk, from the current level down.

`DIR OPT D` – 'D' is for 'Directories'. This option lists only the directories, not individual filenames.

`DIR OPT I` – 'I' is for 'Interactive'. As the DIR command lists each file out in the current directory it pauses. Press [Return] to carry on to the next file, Q to quit back to the CLI, or DEL to delete the file (that's typing D-E-L, not pressing the [Del] key). Typing T will type a text file to the screen.

These options can be combined – for instance `DIR OPT AI` will do an interactive directory of all files on the disk.

Another good tip for using DIR is to get the hang of 'pattern matching'. A few examples will illustrate this best:

`DIR FR?D` – the question mark is a 'wildcard' character. This command means, "list all files with four letters in the name beginning FR and ending in D, but the third letter can be anything at all." Files such as FRED, FRID or FRSD are listed if they are on the disk.

A '#' is used to mean "any number of the following characters", so #? stands for any number of any characters:

`DIR FRED#?` – this command would list any files beginning with FRED, so FREDA, FREDERICK, FRED.DOC and plain FRED itself would all match this. `DIR FRED#? OPT A` will find FRED... files in all directories.

`DIR #?` – This just lists out everything, since #? matches all filenames. (In fact the DIR command by itself lists all files, but the #? pattern can be useful in other commands, like `DELETE #?` to delete all your files.)

A final tip for the impatient. Getting a DIR listing can be a slow process given the speed of the Amiga disk drives. If your disks are old, and the data on them is consequently very 'fragmented' (broken up into small blocks), you can speed up disk access by FORMATting a fresh disk and COPYing all the files onto it. The files are written in sequential order creating a tidy disk which DIR can scan slightly faster. You need two disk drives really: if you have an A500 and they are called DF0 and DF1, then

```
COPY DF0: TO DF1: ALL
```

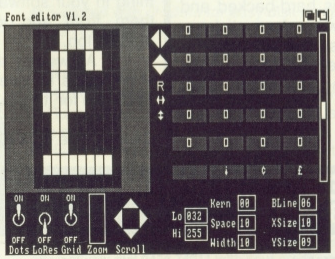
copies all the files and directories for you, from the disk in the internal drive to the external drive.

David Twigg-Flesner
Gronau, Germany

Free fonts

Fancy some extra fonts for exactly £0.00? Boot up with 'The Very First' (the guided tour disk provided with A500s). As soon as the AmigaDOS window appears, tap [Ctrl]-D a few times to break into it and get a '1>' prompt. Type `LOADWB` and then `ENDCLI`. Now put your 'Extras' disk into the drive and run the font editor in the tools drawer, Fed, replacing 'The Very First' disk when prompted. You can now load the new fonts on that disk (use the Project menu on the title bar) and resave them to a different disk. It is best to save them to the 'Fonts' directory of the disk you usually start up with, then any programs you use will be able to read the new fonts.

Alec Tucker
Leicester



■ ***The Amiga's font editor, Fed, on the Extras disk***

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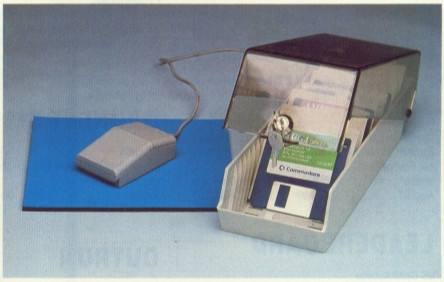

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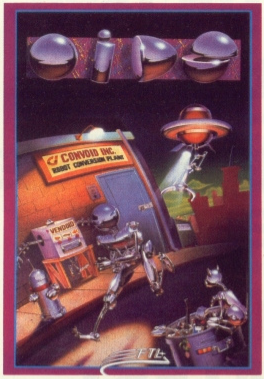

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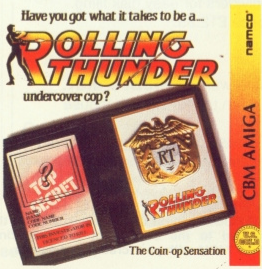

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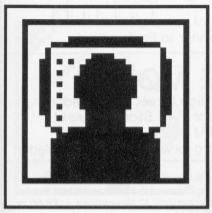


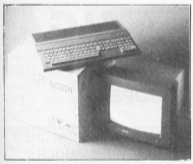
GOLD DUST

Yo, Uncle Sam! What's with the brain drain from Atari US? Why is everyone resigning? And why is the Amiga A2000 a turkey to PC users? Steve Gold posts another monthly despatch on the American

First details of Atari's new TOS for the ST series have now been released. The developer's version of TOS comes supplied on disk, but despite my enthusiastic comments in last month's column, it now looks like it'll be the beginning of 1989 before we see the new TOS available on this side of the Atlantic.

The product looks to be well worth waiting for, however. New on the scene for most users is the provision of a neat disk cache utility that should speed disk operation up all round.

The bad news is that the Mega ST equipped with 4Mb seems to be causing problems with beta test versions of the new TOS. This appears to be due to



the new operating system allowing programs to access system RAM slightly higher than 4Mb, with the result that at the moment the machine crashes.

The good news is that the new TOS's features are a great improvement on existing versions. Major improvements include: better compatibility with IBM PC disk formats (watch out for some new PC emulator packages for the ST in '89), GEM programs can now be auto-booted from disk, and file copying on a single floppy system now uses all available memory for buffer purposes.

Talking of PC compatibility, the new TOS allows a soft reset of the ST to be carried out using (you guessed it) a [Control]-[Alt]-[Delete] key combination. Mind you, if using PC-style commands to reboot the machine is a foretaste of things to come with the new TOS, some ST users might be considering it as a retrograde step!

Going, gone

Talking of retrograde steps, sources in the US suggest that the 68030 add-on unit for the ST, currently still under development (it may yet see the light of day as a separate machine) is not capable of multi-tasking.

Since the primary reason for using a 68030 microprocessor on other machines and workstations is due to the chip's sheer power and capacity for multi-tasking, this has to be a mistake (I hope).

There's no mistake, however, in reports that Neil Harris, top technical guru with Atari for the past four years, has now left the company. Neil left a sad message on several online systems in the US during late September, telling everyone that he'd had enough of the company.

Reports suggest he had just two hours to clear his desk and vacate the building after he tendered his resignation. The good news is that Neil has joined *Genie*, the Washington-based online service, to act as a technical advisor for Amiga and ST online services.

Gone too is Jim Eisenberg, one of the two people who worked on the design of the ST. Details of Eisenberg's departure from the company, and his whereabouts today, have not been publicised.

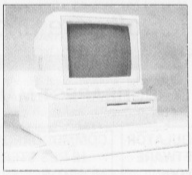
Virus news

Things are pretty quiet on the Amiga front this month, with little real development from Commodore itself. The add-ons and Amiga-relevant third parties continue to provide the Amiga user base with some interesting products, however.

Compute! magazine's books division has just released a book called *Computer Viruses*. The $14-95 book details most known viruses on the Amiga, as well as on a number of other machines (the Atari ST included).

Unlike other books on the subject, however, *Computer Viruses* contains technical information on how the viruses attack the Amiga's operating system, and simple steps to prevent a virus taking hold on your machine, as well as sources of virus protection packages.

Computer Viruses is written by Ralph Roberts, the author of Compute!'s *Using Turbo Basic* and *Using Borland Sprint*. *Computer*



Viruses should be available from import booksellers in the UK. Order using the book's ISBN number (0-87455-178-1). In case of difficulty, call 0101-704-254-3972 or write to Ralph Roberts, PO Box 8459, Asheville, NC 28814 in the US.

A dodo, ATually

Back on the Amiga hardware front, sources on Compuserve suggest that the long-awaited 80286 AT-bridge board for the Amiga may be out in its final form by the end of the year. The bad news is that, according to those online Amiga users who've seen the board, it's going to very expensive.

Several members of the Compuserve Amiga Developer's SIG who've been waiting patiently for the AT-compatible bridge board have now given up on waiting, and bought an 80286-based PC for around the £500 mark.

Since both machines can be linked using a 25-way serial cable, this may be a cheaper option than going for the Amiga plug-in card. The attraction of the Amiga 2000 as a PC stand-in seems to be waning in the US. I wonder how many Amiga 2000's have been sold in the UK to potential PC users – not many, I suspect.

■ *'Gold Dust' is compiled from the US online services by Steve Gold, a freelance journalist specialising in computer communications. Email, industry tips and comments are welcomed on Telecom Gold 72:MAG066 or via the US E-mail networks: Compuserve 76011, 1155, SGOLD (BIX & CIX), and The Source on IP2009.*

HAMMING IT UP

For those Amiga users who are Radio Amateurs, the Amigan Beacon Club has opened up for business on Compuserve's Amiga Development special interest group (SIG). The club has more than 210 members at the time of writing, including Amiga users from 11 countries, many of them in Europe.

In the UK, Bob Wellbeloved (G3LMH, 8 Orchard Close, South Wonston, Winchester SO21 3EY) is maintaining a UK database of information on using the Amiga in tandem with a radio transceiver. Bob has started a UK Amigan Beacon newsletter – it's worth contacting him direct, if you're into packet radio on your Amiga.

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FORMAT LETTERS

What an organised lot you are. Questions numbered one to ten in nearly every letter. No matter, keep them coming to: FORMAT LETTERS, ST AMIGA FORMAT, 4 QUEEN STREET, BATH BA1 1EJ.

Benchmark low marks

Various benchmarks were included in the September and October 1988 issues of ST/Amiga Format which may have misled your readers, and we would be grateful for some space to discuss these benchmarks.

The benchmarks on page 24 of the September issue have serious flaws; two of the file handling benchmarks printed 'start' before opening the files, three printed it afterwards, and the same two printed 'End' after the files were closed, the other three printing it before the close. This meant that the times were unfair on ST BASIC and GFA BASIC since there was no consistency as to when timing started and when it stopped. Some languages may read in most of the file on the OPEN whilst others may even postpone the OPEN until the first READ or WRITE, meaning that you should always start timing before the OPEN and stop timing after the CLOSE. Incidentally, Power BASIC runs this benchmark, with the timings outside the OPEN..CLOSE, in 76s, with a compile time to disc of 16s (instant to memory or RAM disk) and a code size of 9.6K. Lattice C is so fast because it uses macros.

Regarding the Pi-calculation benchmark used on page 32 of the True BASIC review in the October issue and in the September issue, the expression DO WHILE i<100000 is treated differently in various BASICs. In a modern Microsoft-compatible BASIC (like Power BASIC) the evaluation of i<100000 is done using double-precision (16 digit) arithmetic since this is necessary for full accuracy when comparing a single-precision real with a long integer. This involves conversion of both i and 100000 to double precision numbers and a relatively slow comparison operation. In contrast, GFA BASIC uses 11-digit arithmetic throughout since this is all that it has at its disposal.

Thus, you can dramatically speed up Power BASIC's performance on this benchmark by simply forcing a single-precision comparison with DO WHILE i<100000! (the ! forces 100000 to single-precision which is what we want because we are using integers and don't care about great accuracy). When this change is made the timing for Power BASIC comes down from 24s to 10s whilst GFA's time remains the same.

Benchmarks are always controversial but a least try to compare like with like and make them as similar as possible under all languages. Interested readers may wish to log on to CIX and read some of the PCW/Benchmarks conference which is very informative but somewhat lengthy.

Thanks for a useful and informative magazine but please, please try to be consistent, accurate and fair with benchmarks in future.

David Link
HiSoft
Bedford

■ *It's a fair cop, Guv... at least your first point concerning file handling. Unfortunately different members of staff set up and ran our benchmarks on the various compilers. That's no reason for missing the discrepancies between the listings, though.*

Your second point, regarding the precision of comparative tests, is interesting but we feel our test of the exact same loop structure across all dialects of the language is valid. How a particular implementation handles variables internally is really not of concern to most programmers. While we accept that Power BASIC *may well be more accurate than, say GFA, in this area, we were testing the speed of execution, not the precision. Your point would have more weight if mention of the use of '!' to force single-precision comparison and hence increase the speed of execution was included in a 'Hints and Tips' section of your otherwise high-grade manual.*

Book case

I have a small MIDI set up and the last acquisition was Tigress' Patchbox 32 for the Roland MT32. I was very disappointed with the difficulty of actually using it in a practical way. This was entirely due to some basic omissions in the manual. I spent an enormous amount of time trying to come to terms with it and eventually wrote the enclosed letter to Tigress.

I pretty well expected no reply and that's exactly what I got. Perhaps the tone of my letter should have been a little softer but I don't honestly think it would have made any difference and the facts as stated are correct. It would be so easy for them to rewrite, with one or two important additions, which would make a huge difference to the new user. As it is, I have completely given up attempting to use PB32 and this is a great shame because I think it is probably capable of doing anything that could be required of it.

I use Iconix on an Atari 520. The most valuable information would include practical advice on how to connect everything together in a useable system. It seems to me that at some point it might be necessary to unplug some MIDI connections with the units still turned on, which is definitely not a good idea. It would be interesting to see if there is an easy way out of that.

I might add that the problem of manual writers being incapable of envisaging the difficulties of new users is amazingly common and is easily solved by letting such a new user rewrite the manual.

J.A.Trott
Coleraine
Co Londonderry
N. Ireland

■ *This letter, of which only a section is reproduced here, highlights a common problem with all kinds of software and hardware. It is certainly true that many companies leave the documentation of their products to a late stage in the manufacture and are then surprised when the manuals are criticised as being 'rushed'.*

In the software and hardware companies' defence, though, a manual which is acceptable to the first time user and to the seasoned enthusiast is a rare animal (a bit like a three-banded armadillo, but not as easy on the eye). It's a pity more companies can't afford to employ professional writers for their manuals, as they employ professional programmers for their programs. Perhaps Tigress would like to comment on Mr Trott's particular problems.

Bridgeboard of sighs

I have an Amiga 2000 with 3Mb RAM, two internal 3" disk drives, and the A2088 Bridgeboard. What do I need in order to be able to load and run IBM-PC XT programs on the A2010 3.5" internal disk drive, device DF1, and save/load file data on the Bridgeboard's 5.25" disc drive, device A?, such as being able to put an IBM 3.5" disk with the WordStar word processor program on it into DF1, run the program, and then save/load the document on the Bridgeboard's 5.25" disk drive. Also how can I copy IBM (MSDOS) files back and forth between the

A pirate speaks

I thought I would write to put the definitive argument for software 'piracy'. Firstly, the mistake many program swappers make is giving ground to the anti-piracy whingers. We all know the argument about destroying the software industry (yawn). There is only one word for that: 'flannel'. Whether a company is a large or small one, the incentive is the same – PROFIT.

My incentive is as justifiable, I also want to profit by my activities. When things are looked at from my point of view, it can be shown that I have the more valid and ethical arguments. Once again, before the whingers pitch in, I am an ethical individual, I recognise right and wrong when I see it, not when I'm told to see it.

My needs are more important than some faceless fat cat sitting around waiting for the profit/royalties to come pouring in. To be honest, I do not give a toss how much time or effort he/she puts into their product. Do they care how little money I earn and how little I can afford their inflated prices.

You may think that this is just the selfish comment of a disagreeable ******. If so then I refute that, whilst you are building up a righteous indignation, try to extend your imagination to cover more than the superficial arguments created by the computer media. I believe they have a vested interest in the high price of products, for do they not also gain by the increased expenditure of glossy (and unnecessary) adverts?

Frank Doddy
Hull

■ *Despite all your rhetoric, I can't see any 'definitive argument'. Your main point seems to be that the software companies/authors earn a lot more than you. Perhaps if you took the time to acquire the skills and put in the effort that's needed to write a piece of commercial software, you would appreciate how few 'fat cats' there are around. Theft is theft, whether it's software, TVs or cars, and no amount of whinging is going to change that fact.*

Amiga's DF1 drive and the Bridgeboard's 5.25" drive? I've tried setting up a virtual drive on DF1 but to no avail.

Mark Goodrich
RAF Bentwaters
Suffolk

■ *We've been trying to obtain a Bridgeboard from Commodore for review for something over three months, now, so our reply will of necessity be based on what we imagine to be the case. Assuming the Bridgeboard acts through the hardware of the Amiga, there should be no problem in saving text files to the internal drive, though they will be saved in AmigaDos format rather than MS-DOS. As far as we understand it, the Bridgeboard can't cope with writing to the internal drive in MS-DOS format (due to the multi-tasking requirements of the machine).*

I can't get no satisfaction

I have on ST FM (the old type with a half megabyte drive). I got it for Christmas last year believing that for a bargain price of £299 I had got a fantastic computer that I could learn BASIC on without the fear of it being phased out in place of a better computer for at least a couple of years. In reality I had brought £300 worth of computer with a language disk with just a running guide.

At first I was annoyed at not getting a programming book, but soon I was forced to buy one for £13.95. It was then I discovered how slow and useless Atari BASIC is. I just couldn't do anything with it and soon gave up. My parents seeing my depression went out and brought Fast BASIC for £49.95, but this just confused me more. I even joined their user's club, but it didn't help much . Now after 9 months I have about 7 games, am almost bankrupt but still don't understand any form of BASIC and to make it worse still, what do Atari go and do, they put a 1 meg drive in a new ST and I hear that Atari are going to drop their price back to £299. I'm pig sick Atari conned me and thousands of others into buying their computer, and now we have been stabbed in the back. I'm now considering selling my ST etc (at a big loss) to buy an Amiga but I've been saving for ages, and how can I be sure that Commodore won't do the same as Atari?

I'm all for improving computers but why can't computer companies do a deal with owners of their products a) to replace outmoded systems or b) to offer discounted updating of existing computers. I know it is said that this is impractical or rather said to be, but why should people like myself be sold down the river by Atari like we have been. OK, you might say that the situation isn't as bad as I make out but how long before enough new ST's are sold before software firms switch to making games to take advantage of the 1 Mb drive. And OK so computer companies are out to make a profit but out of those profits can't they at least play fair with existing owners.

Darren Beck
Welling
Kent

■ *I really can't see why you're pig sick. You still have a very decent computer with a good BASIC. You can't really blame Atari and Computer Concepts for your difficulties learning to program. Have you followed our Learn BASIC series – that's a third avenue for you.*

It really is unreasonable to expect Atari, or any other computer company, to provide all existing users with upgrade paths when they release new versions of their hardware. You wouldn't expect to have your Hi-Fi, TV or video upgraded, so what's so special about a micro? You can get a double-sided drive fitted to an ST – ask your dealer. Software companies are also in business to make money, so it'll be a long time before they abandon the single-sided format still used by the majority of STs.

The right connection

I am the proud owner of an Atari 520STFM and am desperately trying to find out how to plug my computer into my amplifier of my hi-fi system. Please could you help me!

Wayne Harris
Oxford

■ *You need a product called Monitor Master, available from Bath's very own, dear 'Bath Computer Shack' (0225 310300) at £35. This provides separate phono outputs for connection to an amplifier, and also lets you switch between two monitors. If this is too expensive, see Issue 3's Desktop, which explains how to fiddle two wires out of the monitor socket and connect them straight into a speaker.*

Boring questions

Today was incredibly boring (well at least this bit is anyway) so I decided to write to an intelligent informative incredibly good magazine. Guess what, I wrote to you instead.

Down to serious business now. Since I am a simple, basic person, I will ask simple basic questions

1. Can you connect the ST straight into the telly?
2. Wossalidis about two deals of the ST and what are de udder games with it?
3. Why can't I think of another question?
4. Is a mouse that useful?
5. Does the Leathernecks 4-player extension work with just 2 joysticks plugged in?

Raymond
Limerick
Eire

■ *1. Any ST model with FM after its number includes a modulator and can be plugged directly into a TV.*
2. The 520ST is currently available in two guises – on its own for £299 or with a selection of 22 games and an 'organiser' GEM program for £399. The games are:
Marble Madness
Test Drive
Beyond the Ice Palace
Buggy Boy
Eddie Edwards Super Ski
Ikari Warriors
Thundercats

Ranarama
Zynaps
Quadralien
Starquake
Chopper X
Roadwars
Xenon
Arkanoid II
Wizball
Black Lamp
Genesis
Thrust
Seconds Out
Summer Olympiad
Return to Genesis
3. I bet you can.
4. Yes, if you ever do any drawing, painting or DTP.
5. Yes.

Bias tracking

In your first three issues, out of 23 games reviewed, you have managed to find 5 that are Amiga only and only 2 that are ST only. This amounts to some 21%, and as you well know, is totally misrepresentative. So far, you haven't reviewed a single game of the increasing number that are now £5 dearer than on the Amiga, you've misinformed us about Arkanoid II – it's not coming out on the Amiga and would have been £5 dearer anyway, not £19.95 as you stated, the official advert was only 2 pages away form your review!!

If it's your intention to promote the Amiga and belittle the ST, there's no need to be so devious. If you think ST owners will be happy with this misrepresentation you are sadly mistaken.

I read the majority of the computer press and all the independent sources I've seen say there are at least 125,000 ST's and about 25,000 Amigas in this country. Who's your independent source, a jealous Amiga dealer.

If you continue to bend over backwards to appease Amiga owners you'll surely lose all your ST customers. By trying to hide the truth you are doing nobody any good especially yourselves.

RJ Lattimore
Havant

■ *Oh, come on. Don't be so petty. Every magazine makes the occasional pricing mistake, and according to our information* Arkanoid 2 *will come out on the Amiga. More and more games companies are releasing ST and Amiga games at the same price, which is what's reflected in the reviews. You believe whatever sales figures you want, but your Amiga figure is way low.*

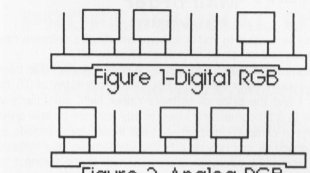
No balls

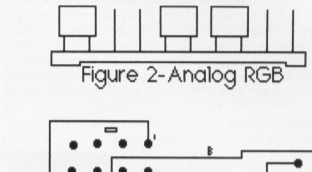
Why is our other national game, cricket, so rarely implemented on a computer and these days not at all? I remember about three versions written for the Spectrum, all pretty dire (with the grudging exception of CRL's Test Match), both in graphics and gameplay, and these days quite unacceptable. One can only imagine what 16 bits and half a megabyte could do for a cricket simulation. In fact, it might turn out to be the only way to beat the West Indies.

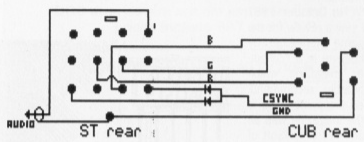
There must be a programmer out there who is also a cricket fan! Where is he/she, for the love of Botham? I cannot believe that a decent cricket game would not be greeted with wild enthusiasm by British ST and Amiga owners. The basic rules and structure of cricket would translate easily enough to computer code. (Child's play compared to Carrier Command, surely?) although integrating a credible gameplay with realistic graphics might prove tricky. So please, you software houses, fill this glaring gap in the 16 bit marketplace and restore our national pride at the same time. Failing this, all readers should write to their MP or this magazine.

R Alexander
London

■ *Please make that your MP and* NOT *this magazine.*







Join the Cub

After having read your reply to Mr Deitch's letter in the September issue of your (incredible) magazine I thought that I must point out that I, like Mr Deitch, upgraded from a BBC to an ST and, not being able to afford another monitor, decided to use my Microvitec Cub. after much experimentation and burnt fingers, I found that it is possible to convert a standard TTL input Cub into an analog input.

All that is needed is to remove the back of the monitor. On the left hand side of the case near the back is a row of links which should look like those in Figure 1. Moving these to the positions in Figure 2 will make the monitor accept analog input. As for the audio on the Atari, I simply use the Hi-Fi that I used for my BBC's Music 500 which gives adequate output (40 watts!) The pin connectors for the Atari monitor connector are also shown. 13 pin DIN connections for the Atari monitor can be obtained from: VIDEX, 26 Queensbury Station Parade, Edgware, Middx HA8 5NR.

J Heath
Keele

■ *Microvitec say that this modification is possible with most models of their Cub range of monitors, though very early models (circa 1980/81) may not have the links available. Look for a circuit board labelled LCCD03 and for plug PL103. This is the link described by Mr Heath.*

Speech, speech

Could you please suggest a good (but not too expensive) assembler for the ST, and a good (but not too expensive) sprite designer which is compatible. Also, as a point of interest, on the BBC 'B' there was a very good speech synthesis program running in the machine's 32K. It makes you wonder why no ST games have such a feature, seeing the amount of memory which is often left unused – it would make an ST version of Mortville Manor just the same as the Amiga.

James Broad
Oxford

■ *HiSoft's* DevPac ST *and K-Seka from Kuma, among others, are good assemblers at modest prices. Superior Software's* Speech *program for the BBC Micro, which you mention, is really not in the same league as that used in* Mortville Manor. *You can understand the one in Mortville, for a start.*

Simple soul

I do like your mag and I am forever picking it up, one thing I find a bit annoying though is you write your mag as thought everyone knows what you are talking about, you haven't made much allowance for the complete beginner like myself. Even the manual which came with the Amiga was of very little help. I thought the manual of the C64 was bad enough but this was no help and seeing as this

Mail order mayhem

The reason I am writing to you is to complain about a software mail order company and the situation in which I find myself.

I have owned an Atari ST for almost a year now and have been thoroughly pleased with the computer. Like most users of 16 bit computers I find the price of software rather high, particularly in comparison to 8 bit computers. I tend to buy software by mail order from adverts in computer magazines. I feel those stores provide an essential service as, not only do they provide software at a reduced price, but also make buying programs easy for those amongst us who may be disabled, or live in a small community and do not have access to computer stores. This leads me to write with my own problem.

In October 1987 I saw a review for the game *Renegade* by Imagine in a computer magazine which heartily recommended the game. Also in the magazine was an advert for MailSoft of PO Box 589 London N15 6JJ, in which the Atari ST version of Renegade was on offer for £13.95. On the 28th October 1987 I sent off an order to MailSoft, enclosing a cheque for £13.95, dated 28th October 1987 and made payable to MailSoft. In mid November 1987 I received a bank statement showing that the above mentioned cheque had been cashed and cleared on 5th November 1987. I then sat and waited.

By March 1988 I was getting tired of waiting so I wrote to MailSoft asking for a refund. I received no reply to that letter but decided to wait a while longer.

In early August I became aware that the Atari ST version of Renegade was on general sale, so expected to receive my copy at any moment. By 18th August I had still heard nothing, so decided to write to them asking either for a full refund, a copy of Renegade or for them to contact me and explain why they had not contacted me sooner.

At this time I have still heard nothing from MailSoft, so I am writing to you for advice. I have copies of the letters written to MailSoft and also have both the cheque book stub and the bank statement showing when the cheque was cashed.

John Bett
Hull

■ *You really have left it an awfully long time before taking any action. Mail order companies are bound by law to display a full address in magazine advertisements, not just a PO box number, so the company looks suspect. As they've refused to reply to a series of letters, and presumably you have no telephone number for them, your only other recourse is an approach to the magazine concerned, who may be able to furnish more details. There are many suppliers more local to Hull than MailSoft, any of whom would be likely to have copies of* Renegade.

was my first disk drive on the A500 I feel that I need some help. So now, here are a few questions that I need help with; I will be getting my new A500 soon so I want to be ready for it.

1. If you write your own program and transfer it to disk, if the disk is only half full, how do you record onto the disk after the first program?
2. I received the golf game 'Leader Board' with my A500. The instructions to load said to load my 'Kickstart' and then the game. I didn't get anything called a 'Kickstart' and even with the 'Workbench' I still couldn't load the game. In fact, it said somewhere to initialize the game. I did as directed by the A500 and blanked my master disk before I had the chance to copy it.
3. I had great trouble trying to copy your free disks, in fact, I couldn't, the computer flashed that it couldn't read, is this because they are for ST and Amiga? I had no trouble just loading the disk but I had trouble trying to run Vilbm from disk 2; in fact, I couldn't run it.
4. I tried to run 'Disk Doctor' not for any particular reason, but the A500 didn't know what I was talking about.
5. What do you mean when you say 'Boot Out'?
6. Is there a decent book that I could purchase that would help a thicky like myself? And a book with some sample programs that I could type in so as to give me some idea what a program looks like.

I would appreciate your help with these problems. Please continue with your super mag and good luck for a long and successful publication.

Mr M Bell
Brentwood

■ *We do try and cater for all levels of experience within Format. Perhaps these answers will help:*

1. You're still thinking in 'cassette mode'. Disk drives store data all over the disk's surface. You don't have to worry about where the file is physically recorded – that's all handled by the disk operating system.

2. Kickstart is a program which is stored in ROM on an A500, so you needn't worry about loading it – it's already there. Leader Board *starts without loading anything. You use it as you would your Workbench disk.*

3. You won't be able to copy all the files from the cover disk in one go, due to the special format, but you should have no trouble copying file by file. Follow the instructions in the Disk Extra section of the magazine.

4. Disk Doctor is a file on the Workbench disk, but can only be operated from the CLI, not the Workbench icon screen. Unless your Amiga suggests running Disk Doctor over a suspect disk, it's safest not to use it.

5. The term is normally 'boot up' and simply means to start up your computer in the normal way.

6. Amiga specific books are fairly thin on the ground, but you could try 'The Amiga System' available from Precision Software (01-330 7166).

PD?

At present, I am attempting to set up a Public Domain software library for the Atari ST and was wondering whether the ST part of your cover disk may be distributed as PD. Full acknowledgment of your magazine would be included on the disk. If you wish it could be offered as a Shareware disk.

Also might I suggest that you devote a page or two to reviews on Public Domain software and suppliers. This could also include inviting suppliers to prepare a file of their catalogue for the cover disk.

Tobias Van Vredenburgh
London

■ *Anything marked as 'public domain' on the Disk Extra pages can be freely redistributed. However, increasingly the ST part of the cover disk is mainly copyright to the readers who have written the programs and sent them in. If you have any specific requests for permission, send them to us and we will pass them on to the authors. We do regular PD updates in* Format.

1000 and 1.1

You cannot guarantee that your free disks will run on Amiga A1000, you say. So perhaps I can help you by advising that there should be no problem if A1000 owners uses V1.2 of Kickstart and Workbench. Both these are on disk with the A1000, which has no Kickstart on ROM, so it is possible to upgrade from the versions 1.1 supplied with new A1000's. Also of course, it will be easier for A1000 owners, like myself, to upgrade soon to 1.3 versions!

Michael Kingston
Bristol

■ *They should be available from Commodore dealers as and when the new versions are finally released.*

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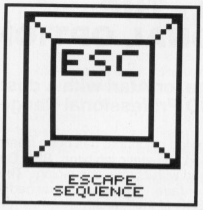


Call that a boomerang?

This is either one hell of a spoof, or the Aussies really are as macho and fun loving as Paul Hogan would have us believe. Just when the last 20 years of arty films have almost convinced us of the average Australian's thirst for culture and the finer things in life, *Boomeraid* bounces back with all the old corked hat expletive jokes that should have gone out like the lifeguards on Bondi beach.

The game is based around a Bushman - style vigilante wandering round the suburbs of Sydney bopping off the scum of the big city with a boomerang. Sounds plausible? Well the program is actually designed to teach basic geometry, as before you wang your rang at the mugger you have to determine the slope and intercept of the straight line that will connect the two. If this is not enough, our hero utters lines like "Strewth" and "Stone the crows" periodically.

The game comes complete with catalogues and order forms for boomerangs and bush hats. Corks an optional extra.

ST
FORMAT
CARTOON CAPERS
ALL YOU NEED TO KNOW TO CREATE YOUR OWN
Issue 6 of ST Amiga Format storms down the road on Thursday 17th November – hitch a lift now.

Disk Virus?

Panic! It would appear that some copies of ST Amiga Format went out last month with a virus on the disk. No, sorry, not *a* virus, *the* Virus. A few puzzled readers, not quite knowing whether to believe their luck, rang in to report that their cover disk appeared to contain a complete version of the then-unreleased Amiga version of Firebird's *Virus*, the game that topped the ST charts.

If only it was deliberate! It'd be a great marketing ploy – "Every month we're giving away a few free complete games, but you won't know whether your copy has got one until you buy it!" No, it seems that Firebird and Format share the same disk duplicators, and a very few pre-production samples of Virus got mixed up with the Format cover disk pile.

If you have Virus and you'd rather have the Format cover disk (Whaddayamean? Of *course* you would), just return it to DisCopy labs at the address given on the back of this month's disk card.

Show Me

The 1988 PC Show used more hype than ever to sell rather less new product than usual. The Psion Organiser, beloved of Marks and Spencer stock-checkers and yuppies with BIG pockets, was there in force. The tie up with M & S obviously goes deeper than at first imagined. Judging by their stand (pictured), it seems a deal has secured many hundreds of the fat calculators against a job lot of used mannikins and the loudest jump suits ever sold by the clothing multiple.

Not content with micros bulging from every corner of their stand, Toshiba chained one of their executives to a table opposite the tube station and ordered him to look busy with one of their laptops for five days. Judging by this shot, he failed fairly early on. "Hello Tosh" jokes were not appreciated.

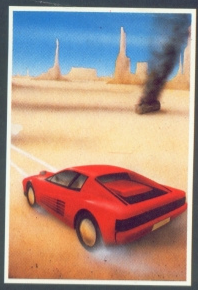
Superheroes, Inc.

by Sarkar

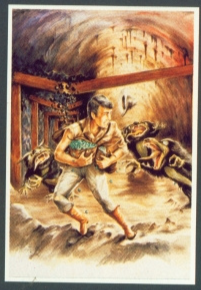
THE ZERO MATRIX... A BAR FOR COMPUTER BODS...
TO OUR FRIENDSHIP!
I'LL DRINK TO THAT!
IT'S TIME WE MADE UP THERE'S ROOM FOR BOTH ST'S AND AMIGA'S IN THE MARKET...
WOW!
MY HEROES... ATARI WARRIOR...
...AND COMMODORE MAN!
I'M YOUR BIGGEST FAN!
YEAH.
I CAN SEE THAT.
I GOT SO EXCITED... WHEN I HEARD THAT COMMODORE...
...WAS GONNA BUNDLE A TV MODULATOR WITH THE A500!
...UH...
BUT I WAS ECSTATIC...
...WHEN ATARI BUNDLED ONE WITH THE 1040 ST!
...UM...
YEAH, BUT BABE...
AMIGAS ARE STILL SUPERIOR TO ST'S.
SHADDAP, BOZO!
ST'S ARE BACK TO £299, SWEETIE...
MARCH! THAT DOES IT! I CARE FOR SOME PUNCH, ARMADILLO BREATH?!
NO, THANKS!
LEMME SERVE YOU A FIST COCKTAIL!
IT WORKED! WITH THEM FIGHTING EACH OTHER...
...MY SINCLAIR PROFESSIONALS WILL ENTER THE 16-BIT MARKET UNHINDERED!
THESE FALSIES AND CORSET ARE KILLING ME...

ROBBEARY
Bertie, an agile and clever bear has targeted a famous 24 floors store for his last and most daring ROBBERY. With no alarms or visible guards and fabulous treasures, yet it has been avoided like the plague by the criminal fraternity. Bertie soon discovers why?
AMIGA £19.95

HIGHWAY HAWKS
Grand Prix driving skills is essential to negotiate the crowded highway at speed. Obliterate the assassins cars and the ones that get in your way but keep the tiger in your tank fed, the engine cool and the tyres and steering intact. Acquisition of faster cars and lethal weaponary depends on your driving and trading skills.
AMIGA £19.95 (2 DISCS)



EMERALD MINE
A giant arcade adventure which has received rave reviews. Each level has its own unique solution and requires ingenuity and dexterity to complete. One player or two players TEAM action for added enjoyment.
AMIGA £14.95
CBM64-PLUS 4 £7.95 (D) £9.95



MANIAX
Maniax relentlessly pursued by the creature undertakes to clear the thick fog engulfing the world capitals. An addictive game requiring quick thinking and action.
AMIGA-ST-IBM £19.95
CBM64-PLUS 4 £7.95 (D) £9.95

QUANTOX
Progress through 24 levels of this fast and furious action. Lightning responses are secondary to the strategic choices between better weaponry or better defence.
AMIGA £14.95

FACE OFF
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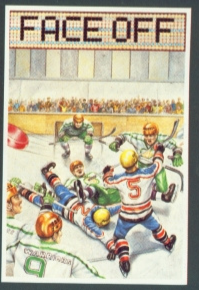
AMIGA-ST-IBM £14.95



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CBM64-PLUS 4 £7.95

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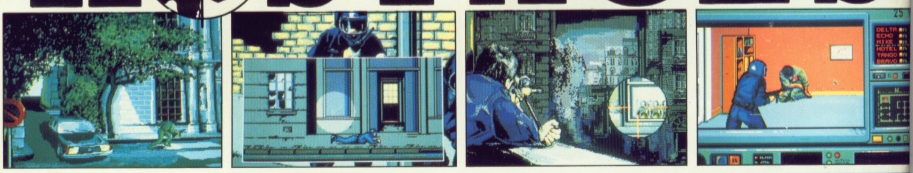

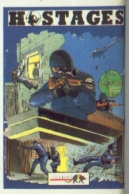

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